The Builder.

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ILLUSTRATIONS.

Exterior View of St. Joseph's (R. C.) Church, Brighton (with Ground Plan) 314
St. Joseph's (R. C.) Church, Brighton.—Mr. R. Kedo Broder, Architect 315
House, Kingston Vale, for Mr. A. W. Peaty.—Mr. T. Searancke Archer, Architect 318
St. James's, Spilsey, Lincolnshire: Restored and Enlarged, 1879.—Mr. William Smith, Architect 319

CONTENTS.

The Government Water Bill 301
Cause and Effect 302
The Lord Chancellor's Land Bills 303
Architectural Lectures: By the late Professor E. M. Barry, R.A.: Architecture in Practice, under the Conditions of Modern Life 304
The latest Discoveries at Pompeii 307
Technical Education of Architects in England and in Germany .. 307
Asylums for the Insane 308
A Church of the Eleventh Century 309
Royal Institute of British Architects 310
A new Flour-mill at Chatham 311
New Buildings at Merchant Taylors' Hall: Visit of the Architectural Association 311
The new Approaches at the Blackfriars Pier 312
The Cost of the Great Eastern Railway Company's new Station at Bishopsgate 312
Terra-Cotta Buildings in Liverpool 313
St. Joseph's Church, Brighton 313
Spilsby Church, Lincolnshire 312
House at Kingston Vale 312
Principles of Ventilation: Parkes Museum of Hygiene 321
The recent Excavations and the Sculptures discovered at Pergamos 321
New Museum and Library, Rouen 322
Walsall Parish Church 322
Architectural Metal-work: Birmingham Architectural Association 323
The Conversion of the Royal Exchange Basement: Introduction of the Electric Light 323
Cleansing Water Mains 323
Society of Lady Artists 324
Architects' Benevolent Society 324
A Correction 324
The Proposed Overhead Railway at Liverpool 324
Manchester Matters 324
From Scotland 325
Maintenance of Roads: Extraordinary Traffic: Williams v. Davies 325
The late Mr. William Aspdin 326
Hulls for the Navvies 326
The Education of the Workman 326
A Workman's Difficulties 326
Value of Timber 326
The Despotism of the Charity Commissioners 327
City Hotel Property, and its Value 327
Eyehill Church, Dundee 327
Surveyorship Items 328
New Bank Premises 328
Competitions 328
Provincials Items 328
Stained Glass 328
New Drainage and Sewerage Works 328
Books: Planché's Extravagances (French); Various 327
Miscellanea 328

The Government Water Bill.

No measure of such importance to the metropolis as the Metropolis Waterworks Purchase Bill has been brought before Parliament since the establishment of the Metropolitan Board of Works. We should, perhaps, except the measures proposed by that body for the same purpose. But in the absence of any preliminary understanding, either with the companies or with the Government, an air of unreality was characteristic of those abortive measures. On the present occasion the Government deserves gratitude for the direct manner in which it has met the appeal for aid; for the full consideration that has been given to very much of the machinery proposed in the Bill; and for the frank manner in which the measure is submitted to Parliament.

Not, however, that, either in the Bill itself or in the speech with which the Home Secretary introduced it, the full magnitude of the matter has been distinctly looked in the face. Mr. Cross spoke of 31 millions, reduced by the deferred nature of part of the stock to be created to an approximate value of 29 millions, as the outside expenditure contemplated by the Bill. The actual amount, however, as we shall proceed to show, falls hardly anything short of 36 millions sterling. And against any rebate for deferred payment, which may be taken at from one and three-quarters to two millions sterling, has to be set the high value of a Three-and-a-Half per Cent. Stock at par, at the present price of Consols. There is a difference of 5 per cent. between this value and that which we ourselves allowed (p. 181, *ante*) of a Three per Cent. Stock at 90, and an excess of 12 per cent. over a Three per Cent. Stock at 96.

We mention this sum of 36 millions sterling in the first place, because it is a feature of such magnitude as to show the importance of a very careful investigation of the Government measure. In that statement, put forth by the Society of Arts (July 5th, 1878), to which some persons will be disposed to attribute the origin of the present Bill, in criticising a pamphlet entitled "The London Water Supply," which he stated had been widely circulated, Mr. Chadwick spoke of the exaggeration of an estimate of 30,381,955*l.* as the value of the property of the water companies at that date. "The total amount required," he said, "would be not 30 millions, as set forth, but 26,396,312*l.*" He added that the purchase of the undertakings would effect "economies, chiefly of administration, amounting to upwards of 120,000*l.* per annum, besides the great economies specified as derivable from the reduction of waste." A statement of so favourable a nature might well have induced a Minister, who must naturally rely on other persons for technical guidance, to undertake a task which has assumed unexpected magnitude under his hands.

The exact figure thus brought before the Water Conference at the Society of Arts occurs as the "total amount of purchase of ordinary and preference share capital and debenture stock, including premiums on perpetual debenture and preference stock," set forth in the prospectus of "The Westminster Association, Limited," under date of May 15th, 1878, being that of a scheme for the purchase of the water companies as an independent speculation. This scheme, as far as we could gather at the time, died a natural death on the publication of the award in the case of the Stockton and Middlesbrough Waterworks in May, 1878.

Having reason to anticipate that the conversation in the House of Commons at the close of last session indicated the possible renewal of some attempt at such a measure as that contemplated by the "Westminster Association, Limited," we gave our readers, on the 14th ultimo (*ante*, p. 181) some of the leading features of the actual condition and rights of the London water companies. From two methods of valuation, based on precedent and practice up to that time, we arrived at a sum of about 29½ millions sterling, in 3 per cent. stock at 90, as an equivalent. This price was stated to be independent of any allowance for compulsory purchase. And if expressed in 3½ per cent. stock at par, our valuation would have been close upon 31,000,000*l.* This latter figure was cited by Mr. Cross as the "ultimate maximum." It will, however, be seen that a charge, neither ultimate nor maximum, of at least 36,000,000*l.*, without any allowance for new works, will be attendant on the passing of the Bill.

The Bill itself consists of two parts. Part I. deals with the establishment of a Water Trust, and acquisition of undertakings of companies, Part II. contains supplemental conditions. A schedule gives the "amount of purchase stock, consisting partly of ordinary stock and partly of deferred stock payable to each of the water companies." This is not summed up. Supplying this defect, we find that the sum of the ordinary stock amounts to 22,098,700*l.*; that of deferred stock to 9,240,000*l.* There is another schedule providing a total of 216,957*l.*, as "purchase stock disposable by each company for contingencies." This schedule refers to clause 37 of the Bill, which, however, says nothing about it. Clause 20 gives power to the Water Trust to, "in addition to any other stock which they are by this Act authorised to raise, issue, in such manner as they may think expedient, any amount of consolidated water stock not exceeding 500,000*l.*" Clause 30 provides that the Water Trust shall pay, discharge, and fulfil all mortgage and other debts, liabilities, and obligations attaching to the undertakings of the said scheduled companies on the 1st day of July, 1880, other than such obligations as are by this Act otherwise provided for. The outstanding debts and liabilities of the companies on revenue account amounted, at the date of the last balance-sheet, to 92,493*l.* The nominal capital of the debenture, loan, and preference stocks amounted, at that date, to 2,758,054*l.*; on which an average rate of interest of about 4·56 was paid. The conversion of this security into the new stock would require nearly 3,600,000*l.* of the latter as an equivalent. Thus we have:—

1. Ordinary 3½ per cent. stock	£22,098,700
2. Deferred ditto	9,240,000
3. Ditto disposable for contingences	216,957
4. Additional stock	500,000
5. Outstanding debts	92,493
6. Conversion of loans	3,600,000
	£35,788,150
On this sum, as compared to the form of a 3 per cent. stock at 90, has to be allowed the extra value of 5 per cent.	1,749,407
	£37,537,557
Allow rebate for deferred stock	1,750,000
Net cost	£35,787,557

This is subject to any question that may arise as to items 3 and 5. But it makes no provision for any increase of accommodation.

Of this sum the amount allotted to the different companies is as follows, fractions of thousands being omitted:—

Stock.	Ordinary.	Deferred.	Items 3, 4, 5, 6.	Total.
	£	£	£	£
New River Co.	6,090,000	3,066,000	1,500,000	10,656,000
East London Co.	3,325,000	1,500,000	544,000	5,267,000
Southwark and Vauxhall	2,099,000	750,000	1,308,000	4,158,000
West Middlesex	3,134,000	343,000	64,000	3,541,000
Lambeth	2,317,500	1,200,000	255,000	3,672,500
Chelsea	1,302,000	675,000	271,000	2,248,000
Grand Junction	2,306,000	900,000	364,000	3,570,000
Kent	1,737,000	846,000	102,000	2,685,000
Grand Total	22,098,700	9,280,000	4,408,000	35,786,700

The value of the several bargains is as under, expressed in per-centage of actual outlay (see table p. 181, *ante*), and in gross purchase of last year's dividends and interest:—

	Ratio per cent.	Year's purchase of net dividend.
New River Company	359	44·1
East London	308	40·8
Southwark and Vauxhall	235	35·3
West Middlesex	304	38·0
Lambeth	273	40·6
Chelsea	196	33·4
Grand Junction	297	37·0
Kent	404	45·2
Average	298	40·0

From the foregoing table it is easy to see that an unusual amount of care and thought must have been bestowed by the Government on the negotiation with the companies. The difference between the two rates of value,—that of the increase of value of the paid-up capital, and that of the number of years' purchase of the actual dividends, is alone enough to show how far each case has been investigated on its own merits. Into that part of the matter we are not about now to enter. We must be content, for the present at least, to present the outlines in

block to the consideration of our readers. But a second consideration is even more evident than the first. That is, that the companies have been represented by men of ability fully equal to that of the advisers of the Government. In this case, moreover, the latter have been fighting *pro domo sua*. And yet, further, there is little room to doubt that the advocates of the companies have held the best end of the stick.

A permanent rental, based on the national responsibility, is as certain as any future income can be. In this country, on the responsibility of our own Government,—at a time when money is a drug,—Consols are always below par. That is to say, that thirty-three years' purchase represents absolute certitude, coupled with the power of immediate convertibility. Therefore, the full value of the actual increase of the Water Companies, if secured for ever, cannot exceed thirty-three years' purchase, or 26,235,000*l*. The difference between this sum and the 35,786,700*l*. of the Government project, which amounts to 9,551,700*l*., is therefore paid for two considerations. One is, the chances of the improvement of the net rental of the companies on their actual capital. The other is, the compensation for compulsory sale. And, according to Mr. Cross, it is the latter consideration which gives force to the former. In fact, the companies demand 9,500,000*l*. above the permanent allowance of the actual income for giving up any hope of future increase.

This is a large sum. It is nowhere stated in block. As far as the matter has been put before the public, it is a sum fixed by the companies themselves. It is their minimum price, however they have arrived at it. The discussion, therefore, is to turn upon the question, "Is it worth the while of London to pay 9,500,000*l*. to have the right of supplying itself with water?"

That is a serious question. But before attempting to solve it, we must remark that it seems to us that a great oversight has been committed. The key of the situation has been wholly left out of sight. It is true that no one has power to compel the companies to sell their property in 1880. What will be the case in 1885 or in 1890?

Mr. Cross mentioned, as a proof of the saving to be effected by the Government plan, that the Southwark and Vauxhall Company wish to spend half a million on new works. Very likely. Does it follow that they are in a position to do so? By no means. The Southwark and Vauxhall Company have statutory power to raise 210,569*l*. more than they have already raised of capital, and no more. If they want to spend 500,000*l*., they must come to Parliament for the power; and so with the other companies. The total of the capital which the companies are now authorised to raise, in addition to that of which we have given the particulars, is 1,190,893*l*. Here then is the length of a very definite tether, the attaining the end of which will quite reverse the position of the companies as sellers or buyers.

If we suppose that the companies can raise this money at 3½ per cent., and make a net profit of 7 per cent. upon it, we find that the value of their actual power in this respect is, at the maximum, 2,381,786*l*., against the 9½ millions actually to be paid increase of a permanent assurance of the present income. They may urge that this income is capable of increase without further outlay of capital. To a certain extent this may be so; but only to a certain extent. What is more clear is, that within four or five years they will have to come to Parliament for further powers. Then will be, we apprehend any man of business would say, the time for making a bargain with them.

We cannot but think that the Minister, in his truly patriotic desire to confer a great benefit upon London, has been counselled by persons who have preferred haste to good speed. Mr. Cross tells us that "we cannot obtain such kind of unification as might do all that can be effected by that step, by any mere arrangements among the companies themselves." He tells us that, as years go by, the value of the companies' property increases, and that he has put before Parliament the best bargain that can be made. If the companies had the statutory right to provide for all the future increase of London, in definitely marked-out proportions, and to raise and issue as much capital as they required for the purpose, Mr. Cross's argument would hold water. But what is the case? From 1874 to 1878 the sum laid out on the works of the company was increased by 1,517,990*l*.; or at the rate of 380,000*l*. per annum. Looking at the steady increase of London, which is at the rate of 2½ per cent. per annum, the 12,687,649*l*. of 1878 is likely to become 13,956,413*l*. by the close of 1882,—that is to say, that in four years from the present time the companies will have to come to Parliament for new powers. And in the face of a certainty, which can only be a question of a year or two in its occurrence, we are now asked to pay this large sum to unify the concerns,—and for no other purpose; and told that we must pay what the companies agree to take, and that if we wait longer we shall have to pay more. On the contrary, there seems to us no room to doubt that the nearer we approach to the exhaustion of the actual capital-raising powers of the companies, the better for the ratepayers will be the terms on which Parliament can and may justly insist.

For, after all, it is a question for the ratepayers of London. It is for them, rather than for Parliament, to decide; and that on the purely constitutional ground they are to pay the cost. Parliament is not asked for a single penny. London, then, has the right to demand that her own decision as to extra-taxing herself shall at least be asked, at least be respected. Let us look at the question of cost. In 1881, if the Bill becomes law, London will have to pay 3½ per cent. upon 26,506,700*l*.; that is to say, will have to pay 927,734*l*. for that for which, in 1878, she paid 794,586*l*. This is an increment of taxation, for the simple change of stock, of 133,000*l*. per annum. But that is for the past year alone. Year by year the burden becomes more heavy. In 1892 the annual payment will have reached, for the 3½ per cent. interest alone, the sum of 1,252,258*l*., or 458,000*l*. more than the present rate of dividend and interest. But the water-rate will not be confined to that figure. Some provision will have to be made for new works. If we put this at the low figure,—when we look back to 1874,—of 250,000*l*. per annum, we have an additional 3,000,000*l*. sterling. The annual expenses of the water companies are now at the rate of about 3½ per cent. on their capital. Without any allowance for wear and tear or replacement of plant, we thus have a charge of 7 per cent. on three millions, or 210,000*l*. Maintenance and management now come to 520,000*l*. per year. Mr. Cross speaks of an economy of 50,000*l*. out of this, but it is not easy to see how it is calculated. But even taking it as it is put, we have the following for the Water Budget of 1892, exclusive of any charge for transformation of works, or anything but carrying on the existing arrangements so as to meet the increase of population:—

Interest on 3½ per Cent. Stock	£1,252,258
Interest and working expenses on extension of works	210,000
Working expenses.....	475,000
	£1,937,258

We may take the estimated population of London in 1892, if increasing at 2½ per cent. per annum, at 4,680,000. In that case, the incidence of the water-rate would have been increased from its present quota of 6·5 shillings per soul to that of 8·3 shillings per soul.

These figures are so simple, so undeniable, and at the same time so alarming, that we cannot repress wonder that it is left to ourselves to bring them forward. We need not say that we have no wish in any way to embarrass the administration. Neither have we any desire to prevent the water-companies from enjoying a good return for their enterprise. But there is a measure in everything. We do not take upon ourselves to say what should be the measure here; but we do say, and we hold that we are serving the metropolis by so doing, what will be the cost,—ay, and the minimum cost,—of the Bill. It is for London to say if she is willing to pay that cost. And more than that, it is also left to us to call attention to the fact that the ratepayer, or whoever may represent him, if such an advocate is to be found, is not quite so unarmed in the case of a conflict with the companies as has been intimated by the Home Secretary, and as must have been imagined by whoever drew up the schedule to which we have applied the simple process of addition. Three or four years hence, at the uttermost, the water companies must come to Parliament for power, and if then it be found desirable to promote such a kind of unification as we have long since pointed out as desirable, it can hardly be expected that Parliament would consent to the imposition of nine millions sterling on the metropolis, in order to purchase that consent.

We have not now space to give that abstract of the Bill to effect which we took the pen in hand. It is, according to all rules, well to discuss principle before detail. For that reason we have addressed our first inquiries to the question of cost. When the public are told that the cost will be 29,000,000*l*., and when our readers add the remark that the sum is within 300,000*l*. or 400,000*l*. of the valuation which we gave in February, not as our own estimate, but as founded on the principles hitherto adopted in like cases, it may be natural to shrug the shoulders and say, "H'm,—a round sum! Three millions more than the Society of Arts talked about. Perhaps we had best close with the offer. They may want six millions more next year." Against this too fatal facility, it is the duty of the publicist, if not to protest, yet at least to raise a word of warning. So far from 29,000,000*l*. being the ultimate maximum, we have shown that 39,000,000*l*., will be nearer the mark. And so far from the Government being in the case of the purchasers of the Sibylline leaves, the reverse is their actual condition. To-day the companies may ask their own terms, or refuse to deal. Four years hence they will themselves be applicants for legislative aid, and it will then no longer be a case of Hobson's choice.

We observe that the press at first received the speech of Mr. Cross with tokens of gratitude. A few days have passed, and the comment is everywhere heard,—"But it is a large sum." Up to the time of writing we have nowhere seen any attempt but our own to ascertain, from the Bill itself, how large the sum to which it pledges the rates will be. We cannot suppose that public satisfaction will be increased by the mention of the real amount. The motive stated in the first clause of the Bill itself is to improve the existing supply, and at the same time to diminish its expense. The Bill contains no provisions for improvement of supply. It contains no provisions for decrease of cost, nor any indication of the mode in which such decrease is to be effected; but it provides for the payment of 5,600*l*. a year to three new officers, and for the payment of 16,524*l*. per annum to existing officers when pensioned off. The 120,000*l*. a year profit promised to the Society of Arts has shrunk to a hoped-for 50,000*l*.,—but how this is to be obtained is not told. On the other hand, in the inflexible demand of interest the increase is certain and progressive. It begins at the rate of 133,000*l*. a year over the actual outlay, and mounts up, by 1892, to 458,000*l*. a year in payment to the existing shareholders. Allowing a full ratio for the increase of London, the project will raise the rate per cent. from 6·5s. per head to 8·3s. per head by 1892, and that without a sixpence having been laid out in the way of improvement. And this is to be agreed on in a hurry, because thecompanies will not take less, although,—four or five years hence,—the companies will themselves have to come to Parliament.

Such are the main points of the case. It is for the public, not for us, to express its opinion upon them.

The events which have transpired since the above was in type have put an end to any immediate proceedings as to the Water Bill. Sir Charles Dilke's profound and pertinent questions (to the main part of which a full reply is given in this and our former articles, p. 181 *ante*, taken together) were naturally not put on the 8th current. And on the 9th current Mr. Cross distinctly stated that the Bill would not appear again on the paper this session; adding the very important promise that, in case of its revival, the ratepayers should be duly consulted. Nothing can be more fair and above board than this. At the same time, we may be permitted to express a caution that the stirring occupations of the hour should not be allowed to divert attention from the real gravity of the subject. We are confident that we have suggested the true key to the future dealing with the matter, in the actual limitation of the capital of the companies. And we wish to add that we have had the actual value of the deferred stock calculated by use of Mr. Hoskold's valuable tables. It amounts to 7,651,320*l*., taken on the 1st of January last, or a rebate of 1,628,680*l*., instead of 1,750,000*l*. When to this is added the difference between the value of a 3½ per cent. stock at par and that of a 3 per cent. stock at 96, the actual cost of the measure will be seen to be upwards of 38,000,000*l*.

CAUSE AND EFFECT.

THERE is no department of human progress which is more honourably connected with our own country than that of the press. The position which it has attained is not only due to its enormous development, but to the honour which is paid to it by the community at large as a tribute to its usefulness and self-respect. A sense of its own responsibilities is especially called for under the circumstances of an inquiry which is still pending, and it is often necessary to use great discrimination between the duties of a reporter or narrator and those of a self-appointed arbiter or judge. This distinction is rendered imperative in the case of the law courts, and a neglect to embody it has not unfrequently led to an interference on the part of the Bench, which has the power to enforce its recognition under the penalties that may be inflicted for contempt of Court. We are not aware that the Board of Trade has power to protect itself in the same way during the course of inquiries which are being conducted under its authority, but as the principle involved is identical in both cases, we would be the last to transgress in a matter of such importance to the impartial character of its decisions. At the same time, our columns are not available for the ordinary purposes of full reports such as appear in the daily newspapers. If this were the case, a careful *verbatim* account of evidence might be sufficient to discharge the duty which we owe to our own public in cases of importance connected with the departments of the builder and engineer. As matters stand, and although the ground is somewhat delicate, it seems no more than due to ourselves and our readers to draw especial attention to some of the evidence which was given before the Board of Trade Commission of inquiry with regard to the disaster to the Tay Bridge. We do so, not by any means for the purpose of bringing the statements of the witnesses so prominently forward as to bias the minds of those who take an interest in the question, and who soon will have the decision of the Commissioners before them. Our wish is rather to expose the fact that, whether or not the evidence to which we are about to refer is established or broken down, enough has transpired to prove conclusively that the scandals referred to are, at any rate, possible occurrences.

A few weeks only have elapsed since we took occasion to point out the failure of science to provide a method of gauging the actual strength of a finished structure in terms of some exact unit of measurement. The only way in which it is possible to provide a safeguard against the dangers which may and often do arise from this ignorance, is to make use of materials about the strength of which it is quite reasonable to form an approximate estimate. In most cases a person responsible for the safety of a structure is justified in arguing that if certain materials manufactured in a certain way are capable of resisting a certain strain, then similar materials treated in a similar way will be capable of resisting a similar strain. To do this, however, includes the condition that these materials have previously been the subject of scientific investigation, and that those which are to be subjected to a strain with a co-efficient of safety based upon these experiments, must be approximately the same, both with regard to their origin and their manipulation in the course of manufacture.

No one made more important contributions to this department of applied science, in his own day, than Sir Wm. Fairbairn, and although his conclusions have not been always justified by the results of more recent investigations, he at least brought great ingenuity and honesty of purpose to bear upon the long course of his inquiries. Among the other results of his experiments, the effect of repeated meltings upon the strength of cast iron was brought to light, and they went to show that its resistance to crushing strains went on increasing with the number of times it was melted, until a point was reached at which the effect upon the metal was reversed, and the result as regards the character of the metal became more and more unfavourable as the process was repeated. We have referred to this point as an illustration of what has been done to provide those persons responsible for the safety of large structures with data for forming reasonable conclusions as to the strength of the materials they are dealing with. In the ordinary routine of the mechanical engineer, a great amount of information has been collected which is practically available for estimating the resistance of different kinds of iron to different sorts of strains. In making toothed wheels, millwrights are able to produce cast iron which is a speciality for the purpose, and they do this by carefully mixing different brands of cast iron, every one of which has an established reputation, that justifies them in expecting that the metal delivered in one year will have the identical characteristics of that which may be ordered the next. It is upon practical conditions of this kind that the durability of an immense amount of our best machinery altogether depends, and it is upon compliance with such requirement that a more or less reliable substitute has been discovered for the absence of any means for informing ourselves about the actual strength of the materials with which practical men must deal. But what shall we say about the use of materials that are out of the region of scientific investigation altogether, and manufactured in such a disgraceful manner that, in the whole range of his investigations, such a man as Sir William Fairbairn would never contemplate that experiments upon their strength could be of the slightest importance or interest to honest men? As already stated, we do not wish to influence our readers with regard to the value of the evidence brought before the Tay Bridge Commissioners. In bringing it under their notice we do no more than our contemporaries of the daily press have already done.

The following is a portion of the evidence laid before the Tay Bridge Commissioners already reported in our columns:—

Richard Baird, a moulder, was engaged in the foundry at Wormit, for eighteen months. While at the foundry he saw some columns that were unequally thick, being between ¾ in. and ½ in. on one side, and from 1 in. to 1¼ in. on the other.

James McGowan, moulder, also employed at the foundry for eighteen months, examined by Colonel Yolland, stated that he had seen cracks in the columns, varying from 1½ in. to 14 in. in length. These cracks were caused by burning the "lugs."

Colonel Yolland.—Do you know if these cracks went through the iron?

Witness.—Yes, they went right through.

Colonel Yolland.—What was done with these cracked columns?

Witness.—They were painted and puttied. This was done outside the shop, before they left for the jetty.

Alexander Hampton, moulder, was employed at the bridge for five or six weeks, casting the columns. He had been a moulder for twenty-seven years, and never saw such bad iron.

With more to the same effect.

It is quite certain, from the foregoing statements of witnesses, that whether the scandalous methods of manufacturing referred to were resorted to or not, at any rate it was quite within the bounds of possibility that they were. Of the rudimentary character of the apparatus which was erected on the shores of the Tay there can be little doubt; and if the results obtained from the cheapest kind of pig-iron subjected to treatment in such appliances was satisfactory, the satisfaction of the public will be mingled with a good deal of astonishment. If, on the other hand, the evidence of the witnesses whose statements we have quoted, is corroborated by demonstrations derived from the fallen structure itself, then the sooner something is done to protect the public the better. We have hitherto never so much as contemplated the idea that the men who have made a revolution in the civilisation of our century by overcoming the obstructions of nature and subjecting its forces to the daily services of their kind, would require to be placed in the category of those who endanger our lives by the adulteration of food. But if such things as those suggested by the evidence we have quoted have really occurred, then the sooner our contractors are licensed and controlled the better for those who have hitherto been misplacing their confidence in their fidelity. In conclusion, we can only express a hope, not much justified by appearances, that the heading we have chosen is not applicable to the case.

Sunday Art Exhibitions. — Sir Coutts Lindsay has again considerately given the Committee of the Sunday Society liberty to issue free tickets to its members and others to visit the Grosvenor Gallery between the hours of six and eight p.m. on Sunday, the 14th, and Sunday, the 28th, inst.

THE LORD CHANCELLOR'S LAND BILLS.

THE two Bills which the Lord Chancellor has introduced into the House of Lords upon the subject of land are of great importance to the general public. It is a misfortune that too often the public,—if a Bill deals largely with legal subjects,—fancy that it is a matter for lawyers only to discuss, whereas every measure which touches the law is of importance first of all to the public, and not to the lawyers. To cheapen and simplify the conveyance of land very keenly affects legal practitioners, but it is really much more generally important to the public, who are, after all, those who are most properly interested in having land transferred from one person to another with the least possible cost. In the same way, it is ridiculous to see the discussion of the question of the extension of the jurisdiction of the County Courts confined to a knot of lawyers, when it is Brown, Jones, and Robinson who are most concerned in the cheap and effective administration of justice. However, every man hopes that he will never have to go to law, and if he does do so he probably expects that it will be the last occasion on which he has anything to do personally with the blind goddess. Hence arises the individual inertness in regard to legal matters on the part of the several members of the public.

To return, however, to the Bills before us. The first of the two is called the Conveyancing and Real Property Bill, and contains some very important provisions. One of these we have already touched on in an article on the Forfeiture of Leases, for it is in this Bill that Lord Cairns deals with the question of the forfeiture of leases for a breach of covenant. We do not propose to return to this subject, at present, at any rate; but we may mention that it is intended that this clause shall be retrospective, and thus be incorporated, so to speak, in existing leases, not only in those which may be entered into after the Bill becomes an Act of Parliament. But the main object of the Bill is to cheapen the cost of conveying land by shortening the investigation of titles, and to give greater freedom to those who have dealings with real property. Thus, the first sub-section of section 3 enacts that a purchaser of leaseholds is not to call for the reversioner's title. Here at once a stop is put to what oftentimes in practice is a greater expense, for there are many solicitors who, by a somewhat too rigid adherence to rules of existing practice, can, without offending their conscience, fill their pockets with a good many additional six-and-eightpences. Then again, the third sub-section enacts that the purchaser of a lease or underlease is bound to assume that the same was duly granted, and the receipt of a last payment of rent due is made conclusive evidence of the payment and performance of covenants up to the date of the completion of the purchase. Passing on, we come to some provisions which deal with mortgages, for those sections which intervene are of too legal and technical a nature to be noticed here. An important section states that a mortgagee is not to exercise his power of sale until after three months' notice to pay the principal has been given, or the interest is in arrear for two months.

Leaving this Bill, we come to that which is in some respects of greater interest, namely, the Settled Land Bill, by which the Lord Chancellor intends to enlarge the powers of tenants for life of settled estates, and to place, as he has said in the House of Lords, the tenant for life as far as possible in the position of a reasonable owner of land. But it is curious to note the fact, that while Lord Cairns eulogises the English system of settlements, he is trying to pass an Act which shall, so far as possible, enlarge the powers of owners for life of settled estates, and give them such powers of dealing with their land as he supposes, if they were absolute owners, and were reasonable men, they would themselves employ. But why, it may be fairly asked, are not reasonable men who own land to deal with it as freely as if it were money, and why is the unreasonable man to have his estate preserved to him? The reason of course is, that all this elaborate and expensive machinery is required in order that a man's son may necessarily inherit his land. There is no doubt that this theory is one which dominates the mind of most landowners, and that the system of settlement is a very pernicious one we have not the smallest doubt. If you find an extravagant landlord careless of his property, who is tenant for life of settled estates,

he will spend all the money he can. He will raise all the money he can; and if his son does not consent to cut off the entail, so that the property may be sold—which is not very likely—he dies leaving an impoverished estate, which, if it had been his absolute property, would long before have passed into the hands of another who knew the responsibilities and the duties which attach to the owner of land. On the other hand, you get the prudent owner, who, it may be, with a large landed property, would gladly sell some portions, in order, we may say, to start younger sons in business; he is not allowed to do so by law now, nor will the Lord Chancellor's Bill enable him to do so in the future. This, of course, is only one example; others might be given, as of owners of building land who would gladly sell portions out and out and invest the proceeds in business or in some securities; but no; the law steps in, and the man must re-invest in land or in some particular form of security. While we respect the sentiment which impels a man to leave landed estates to an eldest son, and to keep a family inheritance intact, we firmly believe that he should be allowed to do so only by will, and that he should leave all or so much as he pleases absolutely to his successor charged, as he may think fit, with payment of portions for other children. But we unhesitatingly say that the existing system of settlements is pernicious in its operation, and that its abolition would be a great legislative achievement.

Let us now, however, take some of the provisions in the Chancellor's Bill. Though of some length, it really does not make very much difference in the position of a tenant for life. One of the sections states, for example, that the principal mansion, &c., is not to be leased without the consent of the trustees of the settlement, or of the Chancery Division of the High Court of Justice. What an excellent arrangement this is for the lawyers! But why, we again may ask, is not a man to do what he will with his own? Section 6 enacts, among other things, that building leases may be granted for ninety-nine years, which has been done hitherto by leave of the Court of Chancery. Again, by section 22, a tenant for life is to have power, on a sale for building or a building lease, to set out roads, sewers, &c., without the intervention of the trustee or the Court. The fact, too, that a tenant for life may under this Bill sell the whole or part of the settled property, though he is limited in his dealings with the purchase-money, which must follow the tenor of the settlement, will be advantageous in the case of estates on which building operations are likely to take place. For a tenant for life may be willing to get quit of such property altogether, and to invest the money in an estate in another part of England. At the same time, this power is modified by that section which prevents a landowner from selling the mansion-house of the estate, which seems to us to show how artificial and unwise is the present system; for it may be that if much of the land in the neighbourhood of the mansion-house is sold, that had better also be disposed of. The net result of the Bill is clearly to enlarge to some extent the power of a tenant for life, but yet to leave him fettered with many restrictions; and a perusal of it will serve to show very clearly that the system of settlements is one which has but little in its favour, and is, on the whole, harmful in its results.

Sevenoaks.—The Sevenoaks Local Board, at its last meeting, considered what should be done with the land belonging to the Board, situated in the Eardley-road. Mr. Hooker said that at the previous meeting it was decided that something should be done. They were paying interest for the money required to purchase the land and getting nothing for it. He suggested that they should advertise for plans for the laying out of the land to the best advantage. Major German thought that the Board's surveyor was quite competent to prepare plans for laying out the land without competition. The Chairman said that they would have to pay something for the plans. Mr. Hooker did not think that they would. He thought that the architect whose plans were selected should carry out the work. The surveyor said he felt himself quite competent to prepare the plans for laying out the land. Major German did not think that they could get the class of men they desired to go into competition. It was resolved that no steps be taken in the matter until the election of the new Board.

ARCHITECTURAL LECTURES:

BY THE LATE PROFESSOR E. M. BARRY, R.A.*

ARCHITECTURE IN PRACTICE, UNDER THE CONDITIONS OF MODERN LIFE.

In the present course of lectures, of which this is the last, I have sought to show some of the causes which seem to me to entitle Architecture to a high place among the pursuits of civilised men. We have seen that as one of the fine arts she cannot be neglected by those who value culture and believe in its elevating influence in human life. Architecture, moreover, while taking its rank with the aristocracy of the teachers, sympathises with the democracy of the taught. She deals with the wants of men, and calls nothing common or unclean. An art of utility, she is thus assured of permanence among all the shifting phases of a time of transition. Her fabrics, full of interest to the artistic and imaginative faculties of man, are not based upon the quicksands of fashion; but, like the church of old, they are founded upon a rock, and that rock is devotion to the service of humanity. Science, consequently, as well as art, finds a part to play in our architecture, and hence its dependence on technical rules for certain elements of success. Mass, proportion, ornament, and colour, have been passed under review, and found to have each its share in the production of perfection of architectural effect. Finally, Architecture has ever been the loving sister of Sculpture and Painting, ready at all times to invoke their assistance while preserving the power to create for them opportunities for their highest forms of manifestation. Foremost among the arts, she cannot, indeed, abdicate her primacy, and must often be perforce independent of both sculpture and painting; but when appeal is made to these arts to idealise virtue, to commemorate greatness, and to stir the heart, they can never appear to more advantage than when associated with noble architecture and enshrined in worthy buildings.

Leaving now the discussion of general principles, we will pass from the examination of architecture in theory to that of architecture in practice. History will teach us much, but it will not teach us everything. One generation, indeed, resembles another, but it is as youth resembles childhood, and age follows without reproducing youth. The work that architecture has to do in a complicated system of high modern civilisation must ever differ widely from that discharged by her in the earlier and simpler days of the world's history. We study the past to obtain a guide for the future; we seek to read in her open pages some clue to the hidden mysteries of the future, which may help ourselves in our daily round of duties under the conditions of modern life. These conditions present, as we know, many difficulties to all lovers of art, and perhaps somewhat specially to architecture. They who have long encountered such difficulties may perhaps be excused if at times a sense of heaviness and labour lost tends to induce despondency; but youth is a season of hope and boldness, and the young architect, with the experience of the world to guide him, has no right to doubt of success if he be resolved to achieve it. Practice in his art will give him skill. Precepts and lectures never made an architect, but they may still have a certain value; and if they tend in any way to smooth the way of the rising generation, in however slight a degree, they will not be given in vain. If, however, we are to look for any practical results, it seems necessary that such teaching should proceed from those who in their own work have had the opportunity of becoming acquainted with the problems discussed, and the difficulties involved in their satisfactory solution. In a volume of excellent lectures on art lately published, the writer of them (himself a distinguished artist) seems to throw some doubt upon such a theory. Saying, truly enough, that it is easier to write about art than to practise it, he draws the conclusion, which these premises do not logically support, that the less he writes, and the more he paints in future, the better it will be for his art and those interested in it. If we were disposed at the outset to accept such a decision, a perusal of the published lectures would go far to render acquiescence in it impossible; but can it in any case be safely concluded that the right appreciation of art by the public is so unimportant a thing that it can be left without disadvantage to those who are not practically acquainted with it to enforce its principles and criticise its efforts? We have had, it is true, a declaration, from no mean authority, that critics may be described as those "who have failed in literature and in art." Without discussing the absolute truth of any such definition, it may surely be expected that works of genius, either in literature or art, will be most truly appreciated by those who have had some share of success in such matters. Knowing as they do the perils which wait upon achievement, such critics will, at any rate, be able to allow for shortcomings which, to the confidence of ignorance, appear inexplicable. I remember an eminent artist, now no longer with us, standing before a work of his own, in the Academy Exhibition, which had been severely handled by certain critics, and saying "How little these men know of the difficulty of painting a good picture." If it be so with the art of painting, the case is still stronger with that of architecture; for in addition to the difficulties inherent in his art, the architect has to encounter others from which the painter is free, such as incompatible demands on space, time, and purse, with other perplexities which come under the comprehensive title of practical difficulties. Although, therefore, it may be easier, as has been said, to write about art than to practise it, it by no means follows that such writing should be left to those who are not practitioners, and that such a deduction from the principle enunciated would tend in any way to the advantage of art.

With regard to architecture, another theory not altogether different from the above has been broached. According to this theory, the modern architect is the cause of everything that is wrong in architecture, and is therefore to be improved out of existence as a first step to the improvement of our buildings. Misreading the causes of success in past times, this class of critics have developed from their inner consciousness a master workman, who is to unite all the qualifications necessary to produce good architecture. There can be little doubt that in Mediæval times the masters of the trades or guilds were, to a great extent, designers as well as artificers, so that a master builder was then a very different person from the builder of our own day, who, as a rule, provides the capital required to hire others' labour, and does not necessarily work with his own hands. But we have no reason to believe that even in those days the master builder worked without direction. The rules and traditions of the Freemasons and the direction of the clergy, then the great patrons of building, prescribed a set method and design, so that we can now discover the prevalence of a regular system of arrangement as well as detail. It is idle, however, to suppose that amongst ourselves the master builder or master workman will displace the architect with any advantage to art. The division of labour in modern times forbids any such supposition, and we may be sure that architects will continue to make designs and direct the execution of buildings, which will be carried out by builders or contractors.

Having regard, therefore, to this certainty, and recognising the difference between the ancient and the modern system of designing, we have to consider what should be the course of study of the young architect to fit him for his duties. It has been said that he needs but two things, taste and knowledge; but in those two things how much is included? I will assume, for the moment, that he possesses the first requisite. If he has it not, he has mistaken his profession, and lacks that which no teaching will supply. With regard to knowledge, he has even better means of acquiring it than have been enjoyed by any previous age. It is, of course, impossible that a good architect should have too wide and deep a culture, and the requisites specified by Vitruvius will make the best of us feel ashamed of our shortcomings. If, however, we pass by such wholesale catalogues of acquirements as impossible to be insisted upon in a single person, we shall find that it is principally the duty of an architect to study Antiquity, History, and Climate. A knowledge of what has been done is the best guide to the conviction of what may be done, and a true originality will better issue from experience than from ignorance. In these days of facile travelling, architects can readily

* See p. 243, *ante*. It is right to repeat that this lecture, which would have been the sixth and last in the Royal Academy series, although left apparently ready for delivery, did not receive final revision from its lamented author. We recommend a careful perusal of it, and shall probably offer some observations hereafter on a review of the whole series.

become acquainted with the works of antiquity, and have therefore, little excuse for want of knowledge. In the times of the master-workman, he knew but one style, and that the style of his country, or even of his district. Some have found in this circumstance an explanation of the success of architecture in the Middle Ages, and would have us blind our eyes and limit our appreciation in order that, by following a similar course, we may arrive at like results. This, however, is impossible. We have the experience of the past laid out before us as in a volume, and cannot choose but read. Whatever may be the difficulties of modern problems in architecture, it cannot be best that we should face them with self-sought ignorance or declare lack of knowledge an advantage. A study of ancient buildings is, therefore, one of the first requisites in the education of the architect. Such a study cannot, in my judgment, be commenced too soon in his career as regards buildings at home, and therefore easily accessible. An acquaintance with other ancient masterpieces can be acquired from books, to be extended hereafter by foreign travel. Actual measurement and drawing to scale are to be preferred to pretty sketches of effects; for at this stage of his education the architect is storing facts in his mind, and nothing impresses them on the memory like drawing from dimensions taken on the spot. Photographs are valuable as mementos of the general appearance of a building; but they constitute a trap for the inexperienced observer, as they too often lead him to be satisfied with them without working out the subject for himself, and he thus loses the wholesome discipline of hand and mind which drawing from careful measurement will give. Experience in drawing the human figure is likewise most valuable, and should be acquired at this time before the habits of drawing have become too confirmed. Such a power will be most useful to the architect when he has to design the application of sculpture to his buildings. He will not, of course, supersede the sculptor; but he will better co-operate with him, and enhance the effect of his own designs, if he shall have gained some facility for figure-drawing and the power of explaining his views. As discipline, moreover, of hand and eye, nothing can be better than the habit of drawing that most difficult of objects, the human figure.

In studying antiquity, history will almost necessarily follow. The consideration of the forms of ancient architecture leads naturally to inquiry as to their origin, the causes of their existence, and the customs of the people that adopted them. No one can enter into a critical consideration of the Parthenon without some knowledge of Classical religion and habits of thought; nor can we in the same way judge rightly of the Renaissance without some acquaintance with the causes of that remarkable outburst of freedom and protest against the Mediæval spirit. As regards the latter it has written its own history, and we may study in its records the peculiarities of time and place. Thus, in France, the flourishing condition of the Church is evidenced by her magnificent cathedrals; the town-halls of Belgium tell us of prosperous trade, and of the growth of a powerful middle class; while in Germany, the castles perched on hill and crag, frowning over plains and dominating the watery highways, such as the Rhine, denote the prevalence of civil discord, each prince or noble seeking to rule the others by the right of the strongest, and all agreeing to oppress the mass of their countrymen. In England our ancient buildings speak, too, of national character if not of history. Aiming at more moderate results than their neighbours, English architects realised their conceptions more completely, and left less of their work unfinished. If France be the land of cathedrals, England is the country of parish churches, built in styles admirably chosen for the purpose in view, and executed with gravity, moderation, and finish. National peculiarities can be best appreciated through history, and architecture, when studied in connexion with the latter, gains a new interest and charm.

Acquaintance with the works of architecture in lands differing from our own causes us, moreover, to recognise the controlling influence of climate on architectural forms. An architecture of which the controlling idea is that of giving shade and shelter from the rays of the sun is obviously out of place where light and air are the first requisites. These things are now so generally accepted that one is almost ashamed to repeat a truism, but it is not very long ago that a close imitation of Greek or Roman forms was considered a necessity of good architecture, and even now we often see foreign details imported which, however fitting and good under different conditions, suit neither the wants nor the climate of modern Englishmen. On the other hand, we may have the opportunity of borrowing from others any obviously better methods than our own for dealing with similar conditions. Take, for example, the covered entrance or *porte cochère* of Parisian houses. In a climate like our own such a feature is at once so sensible, and would be so architecturally effective in our not too lovely streets, that the marvel is it should not have been introduced into any of the new blocks of houses lately built in London on great properties like the Grosvenor estate. It is strange that with our experience of winter cold and damp and fog, the entrances to our houses should be arranged in such a manner as to involve the maximum of exposure to these dangers to invalids and others, so that a piece of matting to unrol between the door and the carriage is thought a necessary piece of furniture of a gentleman's house, while in Paris ladies in full dress can proceed in comfort to social gatherings without fear of harm to themselves or their garments, both starting and arriving under cover.

In Indian, Egyptian, Italian, and indeed all true architecture, the influence of climate may be seen, as in the open patio of the Spaniards, the court of the Moors, and the atrium of the Romans. Some of these features are so pleasing that we may often wish to adopt them in our own buildings; and there is no reason why we should not, if the difference of climate be duly provided against, as, for instance, by covering the atrium of the Romans, and turning it into a hall, as has been done at the Reform Club, in Pall-mall, of which building it forms the most important portion.

All these branches of study of antiquity, history, and climate may be pursued at home by the architectural student at the outset of his career, though in respect of the last, perhaps, a full appreciation can scarcely be secured without the practical experience to be obtained from foreign travel. He may, however, acquire from books and other teaching a knowledge of facts, which will constitute, as it were, a grammar of his art. He can at the same time be gaining practical experience in the office of architects already engaged in actual work. If proper use be made by him of such an opportunity, he will be training himself to make the most of future opportunities, and fitting himself for eventual responsibility. He will also discover, before it be too late, whether he has chosen his profession wisely, and if he possesses the determination requisite to triumph over the difficulties which encounter beginners in the shape of hard work, often assuming the character of drudgery at uninteresting things. Regularity, order, and exactitude are, he will find, necessary conditions of success in the work of the modern architect. Supplementing his office work, the student should neglect no opportunity of training his eye and hand by sketching out of doors and figure drawing, while, by reading works on construction, and examining buildings in progress, together with their prosaic working drawings, he will gradually acquire a knowledge of the scientific side of his profession, which will be necessary to enable him to embody in actual form his artistic inspirations.

It is at this stage that English and foreign travel is, I think, most productive of good to the learner. Youth is naturally dogmatic. Rejoicing in strength and the dawning of power, strong in the faith to remove mountains, the future seems all bright, and success certain. The sight of the great achievements of olden days will be to such spirits a restraining lesson, a sobering reminder that great men have already played a glorious part, and that their own most painful exertions will not be too much to obtain that success which, to early dreams, has appeared so easy. To merely visit architectural masterpieces as a sight-seer will not, however, be enough. Nothing impresses a design upon the mind like drawing it, and if a moulding be admired, it should be carefully measured and accurately drawn, when the actual proportion of its parts will often surprise those who have judged of it from its effect of light and shade in its place.

Since the Gothic Revival, the habit of measuring and drawing Greek and Roman architecture has been too much neglected, and a consequent want of familiarity with classical detail is often seen in modern buildings. The student will do well, however, not to neglect any opportunities of adding to his stock of knowledge, and will remember to advantage that, though fashions change, true principles of art, like those of the Greeks, remain ever the same. In the details of their works he will find matter well deserving of his study, and both Roman and Renaissance works contain much to extend his knowledge and inform his taste. Whatever may be the local result of any battle of the styles, designs based on classical traditions will hardly disappear from the practice of the modern world. In travelling, the student should, of course, bear in mind that he is still undergoing instruction, and that his time should be devoted to work. How far he may be able to push his researches must necessarily depend upon circumstances, but he should endeavour, at any rate, to see, if possible, Greece, Italy, and France. Returning home, the time has now arrived when he will be eager to turn his knowledge to account, and show, in actual work, what he has the power to do. It is proverbially difficult for beginners to make a start in professional life. The youth just about to be ordained does not at once become famous in the Church, but seeks a title to orders in some quiet curacy. He expects to work his way from subordinate positions to those of dignity and responsibility. It is the same with the lawyer and the doctor. The barrister newly called has to watch and wait until his talents become known and lead him onwards to success. His rewards bear a proportion to his professional experience, so that no uniformity of remuneration can be thought of. The medical man, again, has a steep ascent to climb before the student from the hospital becomes the trusted adviser of society. The young architect, therefore, would have no right to complain if he, like his fellows, had to work hard and bide his time for attracting public recognition. He is, however, more fortunate than they are at the outset of his career, whatever may be the case afterwards. In no profession is there so great readiness, on the part of the public, to entrust responsible duties to inexperienced hands, a circumstance which may doubtless explain some peculiarities of modern architecture. In the present day the most obvious road to practice for the young architect is by the system of competition. If he have used his time well, and have acquired the power of placing his designs on paper in an attractive manner, he is not likely long to want success. How far architectural competition, as now pursued, is a public advantage is a different and more complicated question. We live in an age which has elevated competition into almost a religion, and has applied it very extensively to public life. Clerks, soldiers, and sailors have all to pass the portals of an examination. The information required from a youth is in many cases of such a nature as to perplex those who might be supposed to be vastly his superiors in learning. The late Lord Derby, in writing to congratulate the Queen on the distinction with which the Duke of Edinburgh, when a boy, had passed a naval examination, pleasantly expressed his satisfaction that the system had not yet been applied to Ministers of the Crown, as the difficulties of forming a cabinet would, he was sure, be thereby materially increased, to the detriment of the public service.

In considering the question of architectural competition, however, in connexion with the general adoption of examinations as a means of entering public life it must be remembered that those intended for the latter now to a great extent pass examinations adopted as the best means available for ascertaining that the candidate possesses the minimum of acquirements which the duties of his office appear, in the judgment of his superiors, to require. In architectural competitions, the object is to select a man to whom shall be entrusted a work requiring knowledge, taste, skill, and high moral qualities. The captivating theory of such trials is,—"Let all do their best and let the best win." Who, it may be asked, however, will be the "all" in such cases? Setting aside exceptional instances, it will be the young and inexperienced who will throng the lists, and spend their time, which has not yet acquired any great pecuniary value, in anxious endeavours to captivate their judges. And who is it, again, that judges of their efforts, and awards success and failure? Let the best win by all means, but how is the best to be ascertained? To judge of architecture

is no easy thing. To make a pretty drawing may not be very difficult, but to translate it into actual form demands a higher art, and many a showy design selected in competition has turned out in execution a poor and commonplace affair. An experienced architect, who thoroughly understood the question, would often recommend a design which though it would prove satisfactory in execution would inevitably fail to recommend itself to the highly-wrought expectations of those who would be the judges of the competition, and he, therefore, either holds aloof from the trial altogether, or he is tempted to wound his self-respect by sending a design which he does not approve, but which is likely to please the taste of those who will determine the matter. In competitive examination generally the examiners stand on a platform of superiority due to their age, experience, and knowledge of the subjects of the examination. A young man is not humiliated if the result teaches him that old heads are not to be found on young shoulders. A certificate of proficiency or of distinction has, therefore, a real and definite value. In architectural competitions, however, the state of affairs is different. In some cases professional advisers are called in, and their advice is listened to, but in many competitions, even of first-rate importance, this is not done, and decisions are often arrived at which command no respect, even if they do not give rise to complaints of unfairness. It is not surprising, therefore, that architects of experience manifest an increasing distrust of competitions, and in order to overcome such distrust a system of limited competition has been tried. In these cases a small number of architects are selected and invited to compete. A moderate honorarium is given to each competitor, although in some cases nothing is given except a promise to employ the successful competitor. Not long ago, a committee desiring to erect a club-house invited no less than twelve architects to submit designs on the last-named principle. They succeeded, I believe, in thus obtaining a dozen designs at the price of one, though, in consequence of various refusals, not from the architects of their original selection. Proposals of this kind appear to ignore the fact that the design of an architect has any value, or costs its author anything. The expensive education, and the time that must elapse before a living can be made in the profession, are not considered, and it seems to be believed that architects will always be ready for a scramble, and eager players in a lottery when the odds are eleven to one against them. The effect of such a conviction on the general welfare of architecture, and of the whole profession, constitutes a heavy drawback on the advantages afforded by competition to the young architect in first making his professional start. A case came lately within my own experience in which, after several architects of note had declined competition, the work fell in consequence into the hands of a clever designer on paper, who proved so practically incompetent that his work was in danger of falling within a few months of its completion, and has required to be patched and otherwise dealt with in a costly and unsatisfactory manner. It was, doubtless, to avoid such risks as these that the system of competition restricted by previous selection came into use, and has been adopted by the Government, and if it were possible to guarantee that it would be carried out in good faith, the system might have much to recommend it when applied to cases of first-class importance. Unfortunately, it would appear from experience that this is impossible. People ask architects for designs which involve great sacrifices of time, trouble, and cost without apparently the conviction that by so doing they undertake also to be scrupulously upright, on their own part, in observing the terms on the faith of which they ask and obtain such sacrifices. As any payment made is small, and given as an honorarium only, all the competitors but one work without remuneration, a circumstance which should entitle them to the most strictly just treatment. No one would think of inviting the Attorney-General, with eleven other leaders of the bar, to work out a difficult case, on the promise that to one of them the professional conduct of it should be ultimately entrusted, nor would any one expect to obtain the opinions and advice of twelve eminent physicians, in order that he might choose one of them. If, therefore, architects are expected to do that which no other profession would tolerate, they have certainly a very strong right to demand that when they have devoted themselves, perhaps for months, to a work, and have made and delivered designs, thus trusting others with implicit confidence, they should be treated in return in accordance with the highest principles of justice and equity. Those who have most acquaintance with competitions, as now arranged, can say how far such a description would as a rule apply to them.

In dealing with architectural designs, it seems too often the case that those who have obtained them recognise but slightly the obligations which in other cases would be readily admitted. While the law sanctions and enforces the strict terms of a commercial contract, agreements made with architects to obtain their services in competition are too often treated as binding one side only, and conditions of competitions, even when to all appearances guaranteed by names which should command respect, are violated both in spirit and in letter.

Such are some of the dangers of competition, and few can say that they do not seriously impair any gains from the system. Good faith is obviously a condition absolutely necessary, if it is to continue to prevail. Not having myself ever entered largely into competition, I cannot say that my limited experience of it has given me much confidence, if, indeed, it has not led me to think it must be an axiom with public men, that it is not necessary to keep faith with architects, just as we know a similar doctrine was at one time held in respect of heretics. As long, however, as the system of competition prevails, it opens a means of advancement of which I advise the young architect to take advantage. After such training as I have described he will return from his travels with his mind well stored with ideas, and his sketch-books full of sketches. His time being as yet his own, he will make no great sacrifice by devoting a share of it to unremunerative work. It will be good practice for him to bring his conceptions into a practical shape, and apply his taste to designs of palaces, town-halls, cathedrals, law-courts, or other buildings for which designs are sought in competition. The young architect in such cases loses little or nothing if he fails, while, should he succeed, he obtains at once an opportunity of acquiring the experience which he lacks to give full value to his labours. He will gain it the more readily from finding himself entrusted with grave responsibilities of life and limb, and with the control of expenditure usually measured by thousands at a time of life and professional standing at which his friends in other professions are generally still in training.

Competition is, therefore, clearly an advantage to the architectural student anxious to get rapidly into practice. Opinions will, however, differ as to the degree in which the system conduces to the public interest, or in the long run benefits the art and the profession.

An architect, like any other man, desires success and hopes for fame. It is to the interest of the public to avail themselves of his ambition, and secure his efforts for public services. He must live by his art, and will usually depend on private patronage for the satisfaction of his requirements under this head. For fame and distinction he must look to public works, which all can see and appreciate. Wren is known as the architect of St. Paul's Cathedral to thousands, who are unaware of his numerous other works, some of which are possibly more highly esteemed in professional circles. The charge of the public works of a country must always be an object of legitimate ambition to its citizens, and society has, therefore, a right to expect the benefits likely to result from such a condition of things. It is, therefore, a matter of regret on public grounds that any tendency should exist to treat architecture as a merchandise, to be supplied by contract by public bodies or Government Departments. When the great London Post-office was built, the design was entrusted to Sir R. Smirke, who well performed his commission, though of course neither he nor any one else could then foresee the immense development of postal business which was soon to follow, and to demand proportionately increased accommodation. We have lately seen a new post-office erected opposite to the old one, and apparently even larger than its predecessor. For the erection of this building it was a matter of almost official boasting, as a matter of economy, that no architect was employed, and that it would be designed and carried out by the clerks of a department. This system has been since adopted in other cases, and extended, so that it would seem to be intended to make the employment of architects on Government works the exception, instead of the rule, as heretofore. If at the same time the system of competition should be so worked as to intrust other public works to inexperienced hands, the most important of the legitimate roads to distinction will be closed in the one case to the profession altogether, and in the others the public will fail to receive adequate guarantees of efficiency.

With reference to the influence of competition on art, we must remember that the value of an artist's work must be measured by its sincerity. It must aim not at merely pleasing the first hasty judgment of persons perhaps insufficiently instructed, but at the satisfactory solution of grave problems in such a manner as to be worthy of the lasting approbation of posterity. The qualities which are most likely to command success in competitions are often in sharp contrast with those which are necessary for the attainment of the latter object; and some architects of eminence have in consequence consistently declined to enter a competition on any terms. The temptation to promise impossibilities, to hide difficulties, and to make things pleasant all round, proves often too great for any but the most robust artistic virtue. Few persons of real taste and knowledge of architecture would choose competition as the most satisfactory method of obtaining a good architectural design for a private work, and it has yet to be explained why the public ought to be more easily satisfied.

The influence exerted on the profession by competition cannot but be serious. It will doubtless always exist in the case of works of minor importance, and it is, I think, very desirable it should do so to provide suitable opportunities for young men of talent to show what they can do. If it be the interest of the public that there should be good architects, there can be no question of clashing with the interests of the profession, which, rightly understood, are identical. Anything which deteriorates the character of a profession is a public loss. Competition by smoothing the path of the beginner may perhaps involve danger in the end. It is in no case desirable to tempt men to adopt a calling for which they have no special fitness until a calling becomes crowded in excess of the demand, and bitter disappointment succeeds the dazzling hopes raised by unduly early success. A time comes, moreover, when men may point to what they have done as an evidence of what they can do, and may fairly expect to reap the success they have earned without being exposed to the fierce blasts of competition which they were ready to encounter in their youth. If by a general adoption of competition abstention from public life is forced on such persons, a profession thus shorn of its fair rewards for those who have climbed its heights may easily become lowered in tone, and cease to attract to its ranks those who are best qualified to fill them.

The system of architectural competition is thus, we may see, many-sided; and while I advise students, under present circumstances, to avail themselves of it, I have been anxious that my advice should not be misunderstood in reference to the many important questions raised by competition in the interests of art, the public, and the architectural profession.

It now only remains for me to say a few words in conclusion on the practical duties of the architect. I have supposed that he has worked hard and done his best to acquire a knowledge of his art in both its artistic and scientific branches. I further take for granted that he has a real love of architecture and liking for his profession, without which his calling will degenerate into a mere commercial business. If he be without artistic feeling, no amount of study or external teaching will make him a great architect. Assuming, however, the existence of such a feeling, a few words of practical advice may not unfittingly close my series of lectures. Having pointed out the chances offered by competition to the young architect, it is necessary to add that, if he will profit by the opportunities given by it, he must be careful to justify his selection by perseverance and earnest work. He must remember that the work of life is a serious thing, and that he has now entered upon his responsibilities. Whatever his ability may be, he must take care that it is put forth in its integrity. "Whatsoever thy hand findeth to do, do it with all thy might." While bringing

to all his work the refining influence of beauty of art, the architect must also justify himself by the canons of utility and economy. It ought not to be possible to say that builders' houses, if more ugly, are more comfortable than those on which architects have been engaged. Questions of warming, ventilation, and lighting, should not be regarded by an architect as beneath his notice because he claims the title of artist. He must, undoubtedly, be an artist first and a man of science afterwards. He can never acquire the first character if it be not inborn, while he need never want for scientific teachers if he will only recognise the importance of the subject, and qualify himself to reject the evil and choose the good. He must not expect, however, to bend the real wants of his time in accordance with his own arbitrary views of taste; but must remember that, as a modern architect, he has to work in accordance with the conditions of modern life.

With reference to economy he must regard it in its widest sense. In the historic masterpieces of the past it was not the economy which is meant when pounds, shillings, and pence are alone considered that ruled the designers. Mere cheapness of first cost proves often enough a very expensive delusion; but there should always be seen in the work of the architect economy of resources, economy of truthful simplicity, economy of plan. Few persons outside the profession, and perhaps not all who are within it, recognise the vast importance of the last consideration, and I cannot advise the student too strongly to give the utmost attention to his plans. In so doing he will not only be promoting economy, but will secure opportunities for the display of his taste by well-contrived internal effects. With reference to the pecuniary meaning of economy, the young architect must be on his guard. He will be surrounded by those who will press upon his notice materials and methods of construction which have no merit if they are not cheap. Plaster to look like stone, deal to resemble oak, stone to vie with marble, with other things too numerous to mention here, will be passed before his confused vision till he may be tempted to think with a veteran author still amongst us, that he is living in a world where "everything is anything but what it seems." He will be wise to avoid hasty conclusions in such matters; and if he regard himself as acting like a trustee for his employer whose money he is expending, he will not be too readily led along the path of innovation. Good building can never be what is miscalled cheap building, and an architect should never attempt to compete with the speculative builders. We constantly hear complaints from those who live in badly-built houses, but it may be doubted if many of the complainants would be willing to pay the increased rents which a better system of building would involve. It is common enough in such cases to blame architects for a state of things with which they have nothing to do, and against which their practice is, or should be, a standing protest. The better built and finished houses of the last century were erected with cheaper labour and materials than can now be obtained, and the architect must explain to those who consult him that solid walls, rigid floors, good drainage, and efficient sanitary arrangements, are worth paying for. He should further satisfy his employer that he makes the latter's interest his own, and in this way will often lay the foundations of friendship which will outlast the circumstances from which it has first arisen. It need hardly be said that to justify such confidence as an architect receives, high character and honour are absolutely essential. An architect's office is, of necessity, one of trust, and I am proud to believe that the instances are few in which confidence has been shown to be misplaced. Let each man on entering the profession regard himself as a depository of its honour, and determine that in his hands it shall lose no lustre. Let him set an example of earnest work, and consider it a matter of conscience to do his very best in whatever is committed to him.

Acting on such principles, and with the history and art-treasures of the world to inform the intellect and to improve the taste, the architect of to-day will be prepared to battle strenuously with the difficult problems of the high civilisation of modern life; and though his ways may differ from those of olden days, he will find success by reconciling the ever-advancing science of his day with the principles of art, which, as far as they are founded on truth, are as immutable as truth itself.

THE LATEST DISCOVERIES AT POMPEII.

It has often been assumed that the ancient and buried city of Pompeii had been excavated to its very depths, and explored to its utmost limits, by modern archæologists. So far, however, is this from being the fact, that every year adds to our knowledge of the most perfect illustrative relic left to us by antiquity. In 1863 it was thought that all the possible discoveries had been made; but the Italian antiquary Fiorelli indignantly rejected the idea, and has ever since been pursuing his researches. According to his view, the explorations which were commenced more than a century and a quarter ago had for their principal purpose the collecting of treasures or enrichment of royal museums; but a new phase has come over the spirit of the investigation, and it is Pompeii itself that is sought to be restored to the knowledge of the world. Such, at any rate, is the opinion of M. Gaston Boissier, while summing up the results of the most recent discoveries, which have included, not merely the mansions of the wealthy, decorated with graceful frescoes and sumptuous with precious marbles, but also the homes of the Pompeiian poor, with their grotesque caricatures of art. Twelve years were bestowed by Fiorelli and his colleagues upon this unpromising research, but historical, if not material, treasures were yielded from beneath those beds of ashes,—streets of the humblest dwellings, ranges of the poorest shops, the middle and working-class life of that almost-forgotten time. It results, however, from these inquiries that the "City of Cinders" was more than once destroyed and more than once rebuilt, upon old and, apparently, indestructible foundations. The cursory visitor sees only walls of marble or of brickwork encased in stucco, such as might have been hurriedly erected in the age of Nero; but underlying these were at least two towns, belonging to as many different epochs the traces of which the Italian archæologist has, at last, laid bare. To the elder of these, however, the date assigned goes no further back than the sixth century before the Christian era; but it exhibits an architectural style, characteristic enough, if not unique,—Cyclopean blocks of stone, piled one upon another, without cement, and forming four-sided courts, within which the habitations of the common people, vestiges of which are still apparent, were crowded. Gradually, it seems to have become necessary that these external ramparts should be increased in solidity and height, and should assume more and more the character of fortifications; but their remnants are all far below the ordinary ground-level now, and Fiorelli thinks that, even beneath these, though at a considerable distance down, the relics of a fourth Pompeii may be brought to light. If so, the fact would tell marvels as to the fidelity with which mankind have ever clung to tradition and locality. The earliest city yet discovered, consisted, we are told, of streets running invariably at right angles, one with another, with a wall encircling the whole, the outline of which was marked by the footprints of a horse and an ox, yoked together, while the interior, thus described, was divided into nine districts, or "regions," to employ the Roman term. There was, moreover, at Pompeii, even in its earliest youth, a distinct identification of another kind.

Signor Fiorelli rejects all such fanciful designations as "the House of the Grand Duke," "the Russian House," "the House of the Princess Margaret," and so forth, and prefers to take, from authentic inscriptions, titles like the "houses" of "the Faun," "the Dancers," and "the Cytherist," leaving Cicero, Panza, and Sallust out of the question, as merely imaginative designations, not historical in any interpretation of the term. A singular fact, however, put beyond doubt by an inscription which was among Signor Fiorelli's discoveries, is, that the owners of these Pompeiian palaces, when they were too large for themselves and their families, took in lodgers. For, the words are quoted, which he himself copied:—"To let, in the house of Cn. Alleius Nigidius Maius, for the first of the July Kalends, shops, with terraces, cabinets, &c.—Apply to Prinnes, the Slave of Cn. Alleius Nigidius Maius." Perhaps no greater curiosity was ever unearthed at Pompeii than this. But Signor Fiorelli is very far from believing that the Pompeiian explorations have as yet reached their limits. He has proved that there was much more concealed under that site than the conventional atrium and peristyle, the rooms for masters and slaves, the public and private chambers. The fresco of Orpheus, of course, possesses the most attractions; but the inner life of a generation more ancient may be more interesting from an antiquarian point of view. Thus, the mansion of the banker, L. Cæcilius Jucundus, was a thorough illustration of a rich man's luxury, in the Pompeiian epoch, with its great reception-hall resplendent with painted mythology; its pictures of hunting episodes, its battles, coffers for treasure, and suggestions of epicurianism everywhere; but this was all Greek or Roman, or modified from Greece and Rome. The figures introduced are wearers of the toga and the purple; they are being amused by dances and festivals; the lower Pompeii is out of their sight and recollection altogether. Far below it, as it has been familiarly made known to us, exists a labyrinth of narrow thoroughfares, wherein the dwellings, though small, consist of numerous chambers, evidently designed, from the frequent repetition of the bath-room and kitchen, to accommodate several separate families each; yet even among these, attempts at elegance, in the shape of architecture and mosaic, are occasionally to be distinguished; for, even now, Signor Fiorelli declares he has not come upon what must have been the Pompeii of the extreme poor. That still remains to be disinterred, though he does not anticipate finding it beneath the others, but rather as suburban extensions of them. Poverty, in the worst sense of the term, could never, he thinks, have inhabited even the smallest of those houses, with terraced roofs and tinted walls, in neighbourhoods where inns and other places of refreshment abounded. Poverty, indeed, could scarcely have been welcome at those marble counters, whence hot drinks were dispensed in the winter time,—their position being generally,—as so often in the case of modern taverns,—at the corner of two streets. But, remarks M. Gaston Boissier, as Pompeiian excavation has not been sterile of recent years, so it may have much to promise for years yet to come. And in this belief the archæologists of Europe have been considerably encouraged by what has been done of late at Ostia, which, though not so interesting, is scarcely less rich a field of relics than the city that has been described as "the great curiosity of Naples." The earth there is, in fact, a tomb full of treasures, which the Italian archæologists are disinterring every day,—vases, above all, and fragments of cornices and columns, with brazen friezes, marble slabs, altars, masonry held together by clamps of iron, and a hundred other characteristics to distinguish them from the Neapolitan ruins. Signor Fiorelli has been, however, the most recent explorer of both, with Signor Pietro Rosa, and the distinction drawn by him between the two desolate cities and the physical causes of their ruin seems perfectly just. At all events, whatever we have learned concerning them makes it positive that we have advanced, hitherto, not very far beyond their thresholds.

TECHNICAL EDUCATION OF ARCHITECTS IN ENGLAND AND IN GERMANY.

The vigorous onslaught made by Herr von Reichensperger, in a speech delivered in the German Parliament, on the system of technical training and Government supervision of architects in vogue in his own country, has provoked a lengthy reply from the pen of a professional architect, which has appeared in the *Cologne Gazette*, and which, we are told, has been received with general approbation by the profession in Germany, as embodying a very fair statement of their own case. The substance of Herr Reichensperger's criticisms of German architecture, and of his comparison between German and English art, has already been placed before our readers. Herr Reichensperger, as the result of forty years' careful study and continued observation, considers the advantage of the comparison to rest altogether with our country, and, indeed, frankly informs his countrymen that in his opinion it would be no misfortune if the High School of Architecture at Berlin, to which most Prussian architects are indebted to their technical training, were to be closed at once, and the key thrown into the River Spree, to prevent its ever being re-opened. The professional critic in the *Cologne Gazette* pronounces this judgment not only harsh, but positively unfair. He professes profound esteem for the architects in England, and a high appreciation of their works, but with all becoming respect for their unquestioned knowledge and

its practical application, he disputes their claim to superiority over their German brethren. In Germany, the writer points out, architecture is embarrassed by many hindrances and drawbacks, due to the general condition of the country, which cramp and check it in respect of practical work; but as regards knowledge, mastery of the scientific principles, and thorough-going and systematic training, he contends that his own brethren may challenge comparison with rivals in any country. No professional man in Prussia, be he a public servant or a private architect, looks upon our new institutions as perfect or final. Prussia, and, for the matter of that, all Germany, has still, as it has had for many decades back, a smallness of all surroundings to contend against, and from under this load it had to work its way up by a serious effort of physical and scientific labour. As a matter of course all art, and architecture not least, has had to suffer from this pressure of adverse circumstances, and it is the desire and the endeavour of all who are interested that the improving hand shall not rest until it has created a better and more perfect state of things. In other words, art has, in Germany, found its lot cast in a comparatively barren and sterile ground, and has found its action cramped and hindered by a want of means. But lavishness of means, and the use of costly materials, are not the most trustworthy tests of an artist's ability. The writer readily allows that abundance of means, such as exists in this country, confers a great benefit upon art, and imparts a healthy stimulus to its development, for which every artist ought to be thankful. "Happy," says he, "is the country which is rich enough to be able to help itself, and do without State aid"; at the same time, he frankly states his belief that in England that very profusion of means which has so richly fostered the growth of architectural art has lured it away from its proper course, and stimulated an excessive regard for external embellishment. Outward magnificence, abundance of ornament, a display of wealth, and imposing outlines have been studied at the expense, and sometimes to the exclusion, of the less showy but more sterling merits. Dean Swift, in his "Verses on Blenheim House," merely anticipated, a century and a half ago, a complaint for which occasion has become far more plentiful in our own days. Complaints, such as are frequently heard in this country, about insufficient regard for utility and convenience in the designs of buildings, public or private, which look most imposing to the eye, have of course reached Germany. Moreover, as a specific case, the writer in the *Cologne Gazette* quotes the public competition which took place in 1872 between architects of all nations, in designs for a new House of Parliament at Berlin. No fewer than fifteen English architects competed, and at first every one who saw their drawings was struck with the magnificence of conception, the beauty of outline, and the boldness of design which distinguished them. But upon closer study it appeared that to these outward beauties everything else had been sacrificed, and in the end only one of the fifteen drawings obtained a second prize,—along with three others,—not without misgiving on the part of the judges, or without a protest on the part of professional opinion. Now, under the German system of technical education, such a thing could not have happened. It is all very well, remarks the writer, to sneer at "bau-inspectors" and "architectural mandarins," at state supervision and state qualification; but who is to do anything for architecture in Germany, if the State does not? Nobody else possesses either sufficient means or sufficient influence. As regards the merits or demerits of the system of technical education actually pursued in Germany, the writer in the *Cologne Gazette* is content to accept the judgment of eminent men of the profession in England, whose opinions are on record. Before quoting these, he proceeds to state what he believes to be the usual course of instruction in England. As he understands, youths selecting architecture for their calling, as a rule leave school at the age of about sixteen, and become apprenticed to some practising architect, to whose teaching they must look for all their future training. A lad of sixteen, fresh from school, is not likely to have laid in a sufficient stock of scientific learning to qualify him for distinction in his profession. On the other hand, it may be questioned if many of the hundreds devoting themselves to this calling are endowed with sufficient zeal and industry to impel them to supplement the practical teaching which they receive from their employer by a prolonged course of careful and thorough scientific study, without which their art must necessarily degenerate into a handicraft, as indeed in the majority of cases it does. It is here that the German system supplies a want so urgently felt by compelling the student of architecture to pass a public examination, which he cannot do without having previously passed through a regular course of scientific instruction at one of the public colleges. The merits of such scientific instruction, terminating with a public examination, by properly qualified examiners appointed by the State, have, the writer goes on to observe, been duly recognised by leading professional men in England. Indeed, for the past twenty years, voices have been raised in England on behalf of an assimilation to the German system. The German writer quotes from the columns of the *Builder* a passage in an address delivered by Mr. Phené Spiers, as president of the Architectural Association, in 1867, which runs as follows:—

"I have from time to time made comments on the want of a theoretical education in architecture in this country; the absence of any system of teaching the principles of either science or art has, of late, been deplored continually in the various journals, comparisons being drawn between the products of all countries in the Great Exhibition of Paris, and considerably to the detriment of our own. It would appear that, notwithstanding the immense advance which we had at one time acquired over other countries in engineering and commerce, the workmen of such countries as Germany and France, being instructed in the theory of their mechanical operations, were able to work with so much greater intelligence, that not only had they caught us up, but were really surpassing us on what we imagined to be entirely our own ground."

A few pages further on in the same paper the writer finds the following passage:—"A beginner in architecture, who has been occupied with the sciences at school, and who has made satisfactory progress, should pass an examination to show his qualification for his calling." The writer goes on to quote the testimony borne in a report published by the Institution of Civil Engineers in 1870 to the excellency of German technical teaching. In the report it is stated that a young engineer, who had passed through a course of technical studies at a German University, got on in his calling so much better than any of his colleagues and competitors, by reason of the knowledge that he has acquired at the University, that the authors of the report thought it right to cite his example in support of their new recommendation, made at the conclusion of an inquiry into the practice of technical education, that a similar system of instruction should be adopted in this country. The German writer has more English opinions to quote, for which there is no space here, but the burden of them all is that provision should be made for careful and thorough scientific instruction, either by the creation of professorships of architecture at Oxford or Cambridge, or else by the delivery of more lectures on architecture at King's College and the London University, or by other means, and that, in short, scientific study and a searching examination should be made the portal through which young architects, without exception, as a matter of course, should be introduced into their calling. The writer also quotes the project now approaching realisation, the foundation of a central college for technical education, endowed by the City Guilds, in support of his argument that a conviction has became general in this country that there is a real want here of that very system of technical training and instruction, long established in Prussia, with which Herr Reichensperger finds fault. In taking leave of his subject, the writer expresses a belief that he has answered his critic out of the mouth of those very judges in England to whom he had appealed against his own countrymen.

Metropolitan Asylums.—The Metropolitan Asylums Board propose to borrow the sum of 50,000*l.*, to be expended in the following works, viz.:—Balance of order for 7,500*l.*, for erection of adult asylum at Darenth, 270*l.*; ditto for 13,824*l.*; for erection and fitting up of schools at Darenth, 1,824*l.*; for provision of tanks at Stockwell Hospital, 400*l.*; purchase of additional land at Darenth, 6,322*l.*; erection of a new brick pavilion at Stockwell Fever Hospital (for accommodation of tpphus fever cases), 6,000*l.*; alterations and additions at the Fulham Hospital (chiefly in reference to the enlargement of the administration block and for the provision of a stores-receiving room), 5,250*l.*; erection and fitting of adult asylum at Darenth, 22,650*l.*: furnishing ditto, 9,000*l.*,—total, 51,716*l.*

ASYLUMS FOR THE INSANE.*

Bakehouse.—The bakery is sometimes attached to the administrative block, and in this position there is, perhaps, better supervision and better protection from pilfering; but it may also be placed in the workshop block.

Basement Corridor.—The construction of a corridor in the basement, under the main corridor, is of the greatest importance. Among its other advantages are the following:—1. By means of the tramway carried to the lifts in the various blocks a simple, convenient, and rapid service of provisions, coals, and supplies of all kinds to the several wards, attendants' rooms, &c., would be provided. 2. It would prevent the constant passing of attendants along the main corridor. 3. It would afford space for the piping and flues in connexion with the heating and ventilating, and for the main supply-pipes for gas and water, to the whole of the building.

The Rooms for the Assistant Medical Officers should be placed on the first floor of the administrative block, and might either occupy a position to command a view to the south, or they may be arranged over the principal entrance and rooms to the north. In the southern position they would be nearer the wards, but the windows would look upon buildings and airing-yards and exercising patients, scenes that would not operate pleasurably on the mind, or tend to cheer the officers in their hours of leisure.

Head Attendants' Rooms.—These rooms should be centrally placed, and attached to the administrative block, and therefore within easy call of the medical officers and other of the principal officials.

Administrative Block.—The following is a list of the rooms for which arrangements must be made in planning the administrative buildings:—Porch, vestibule, entrance-hall, staircase-hall, hall-porter's room, receiving-room for patients and their friends immediately on arrival, male visitors' room, female visitors' room, committee-room, lavatory and water-closet adjoining, clerk's office, medical superintendent's office, chaplain's office, steward's office, large general storeroom adjoining, goods hoist to the basement and upper floors, receiving-room for goods, crockery store, lavatory and water-closet for steward's department, housekeeper's office, storeroom for clothing (with presses all round), cutting-out room, small room for condemning clothes, blanket-room, bedding-material room, lavatory and water-closets to housekeeper's department, hoist for stores. Dispensary (adjoining main corridor)—waiting-room for attendants; pathological room. Kitchen—back kitchen, scullery, china-closet, pantry, bacon larder, meat larder, fish larder, milk and butter room, vegetable-room for receiving and preparing vegetables, potato-store, fruit-room, flour and bread room, housekeeper's room (small, and overlooking kitchen), preserve-store adjoining, lavatory and water-closet for kitchen servants, serving-room, dining-hall and recreation-hall (provided with stage for theatrical performances, two dressing-rooms, with lavatory and conveniences, gallery for medical officers, and visitors, &c.), attendants' dining-hall (adjoining patients' dining-hall, and communicating with it), conservatory (opening out of dining-hall), lavatory and water-closet for use of patients while in dining-hall (male on one side, female on the other), beer-cellar (under stewards' rooms); coal and wood stores, lumber-rooms, staircases. Junior medical officer's dining-room, small serving-room, private sitting-room (one for each), bedrooms (one for each), spare bedrooms (one for each), small library, bathroom, lavatory, water-closet, &c. Housekeeper's sitting-room, bedroom, bathroom, and water-closet. A similar provision for steward, should he reside in the building. Bedrooms for servants, bedrooms for night attendants, bathrooms and water-closets for servants, house linen stores, service-lifts, foul-linen shoots, housemaids' closet.

Receiving Wards.—These may be distinct blocks in themselves, and may be placed on the north side of the main corridor, unless (as in some cases there may be) there is space on the south side. For the comparatively short time a patient would remain in this ward, the aspect would be of little consequence.

Infirmary Block.—The infirmary block should be placed near the administrative block. The number of patients in the infirmary wards

* From a paper read by Mr. William Dawes, before the Architectural Association, on the 27th ult. (see p. 274, *ante*).

should be calculated at one-seventh of the whole number. Each infirmary should have a day-room, and also a small kitchen with a cooking-stove. The cubical contents of the dormitories should be one-third more than that allowed for ordinary dormitories. Every room in this block should have an open fireplace.

Epileptic Wards.—As epileptics are, as a rule, "the most dangerous, impulsive, and unreliable of all lunatics," and are, more than others, given to plotting and combining together, the day-rooms and associated dormitories for the reception of these cases should be so planned that there shall be no escape from the attendant's eye. Even in the day-rooms there should be no bay-windows or recesses of any kind that could screen them from observation at any point.

The Chronic Block.—This block is the simplest to deal with, and what I have said generally about the other blocks will apply to this block also. All the provisions should be simple and inexpensive. Brightness, cheerfulness, comfort, rest, are effects that may be obtained without extravagant outlay. They should be secured here, for these buildings (that we as architects are called upon to design) will be the last homes for thousands of hopeless sufferers in the time to come, and we should spare no pains to secure for these incurable and lingering patients at least pleasant, comfortable, and healthy habitations, even if we cannot provide them with happy homes.

Dimensions of Rooms.—The dimensions of the various rooms, and their cubical contents, and the superficial area provided for each patient, should be in conformity with the instructions issued by the Commissioners in Lunacy. According to these instructions. no story should be less than 12 ft. in height. In the case of the infirmary blocks and hospitals for infectious diseases, this height would, of course, have to be considerably exceeded.

Fresh Air.—Cubic feet per patient: "600 or 800 cubic feet of pure air is the smallest allowance compatible with health, and the need is even greater by day than by night, because of the vapours and exhalations from the body."

Day-rooms.—The day-rooms should be arranged and should be fitted up so as to present an appearance of cheerfulness, and an air of comfort. They should have open fireplaces and large bay windows, and should command an excellent view of the country to the south and to the east or west, as the case may be. All day-rooms appropriated to the aged, infirm, and excited patients should be on the ground-floor, and, indeed, except in very special cases, the whole of the day-rooms should be arranged on the ground-floor, and should have ready means of communication with the airing-yards or grounds. Where there are no corridors of the minimum width of 10 ft., 40 superficial feet should be allowed for each patient.

Dormitories.—We know how valuable sleep is to sane men. It is, if possible, more valuable to insane men, and it becomes a serious consideration for those who are engaged in building lunatic asylums how best to provide such dormitory accommodation as will (so far as it is practicable) ensure quiet and rest to those who are destined to pass the remainder of their lives in these melancholy chambers. To my mind, the placing of forty or fifty patients in one room is about the least likely arrangement to attain this end. No gain on the ground of more effective supervision can compensate for the comparative unrest of patients who are thus herded together in one dormitory. Dormitories for four or six, instead of for thirty or forty or more, would be more homely, without any loss, possibly even with a gain, of efficiency. Single sleeping-rooms, when many in number, are more difficult to superintend.

Attendants' Bed-rooms.—When an attendant goes to bed he expects to sleep, but his bed-room is sometimes placed very unfavourably for this. It should be placed convenient to the dormitory, but not opening out of it. It has been said, "It is always more difficult to watch attendants than patients." An attendant should not have to pass through a dormitory to his own bedroom. They are not all teetotallers, and they sometimes come home after the patients are in bed.

Proportion of Attendants.—At Brookwood there is one to twelve patients, women; one to ten patients, men. I doubt whether an asylum in which acute cases preponderate can be worked effectually with less than one official to every four or perhaps six cases. At Hanwell, one to thirteen, exclusive of inspectors. At Colney Hatch, one to thirteen, excluding inspectors, head attendants, and night watchers. Rooms should be provided for two or more attendants to each ward, single attendants' rooms not being of less dimensions than 100 superficial feet, and, whenever practicable, such rooms should be placed between two dormitories, with glazed doors of communication.

Workshops and Laundry Buildings.—The position of these buildings upon the site is not arbitrarily fixed. The working patients are drafted from all parts of the building, and therefore cannot be provided for in one ward. Some homicidal and suicidal cases that may be, and indeed are, safe while at work, become dangerous when unemployed.

General Baths Block.—A very extensive use of baths is among the most important means of treatment. "For the majority of inmates a general bath-room, conveniently placed, will be found greatly to facilitate the bathing of the patients." This, however, will not remove the necessity of providing a single bath-room to each ward. The general bath-rooms should, of course, be on the ground-floor, and should open out of the main corridor, so as to be easily accessible by all patients from the various blocks. It should be placed on the north side of the main corridor,—say between the infirmary and epileptic blocks. It might have ten ordinary bath-rooms or cubicles, with dressing compartments adjoining, vapour and shower-bath-room, medicated bath-room, also containing hip, foot, and hand baths, towel-room, water-closet, lavatory, urinals, &c. It is desirable to have a full number of baths, so that the offensive practice of using the same water for more than one patient may not be excused on the ground of there being an insufficiency.

Padded Rooms.—Two classes of patients may occasionally require the use of a padded room, namely, the determinedly-suicidal, who attempt self-destruction by forcing their heads against the walls or on the floors, and the paralytic and weak, who, imagining they are strong enough to walk, fall and injure themselves in their attempts to do so. But these cases are not frequent, and in well-managed asylums the padded rooms are seldom used. Indeed, in a large asylum which I have often visited, and which accommodates over 1,000 patients, there was but one padded room, and that I was informed was not used from one month's end to another. By making the padded rooms the same size as the single rooms, they might (if thought necessary to abandon the use of them) be devoted to the alternative purpose, and be fitted at any time to serve as sleeping-rooms. There are several materials used for the purpose of covering the walls and floors of padded rooms. In some cases sacking is used, in others indiarubber. It is best in all cases to so construct it that it can be easily taken off for cleaning, or otherwise the rooms become offensive and, indeed, unbearable.

Staircases.—The stairs throughout should be constructed of stone, built round a closed well, which should form a large air-shaft (for the extraction of foul air) connected with the main air-trunk in the basement. They should be planned in short flights, and should be very accessible, and easy of ascent and descent. Every staircase should be well lighted, and should be practically fireproof. They should be so arranged as not to be exposed in any ward. Handrails on both sides should be provided.

Water Cisterns.—Cistern towers should be provided to each of the main blocks for the storage of water, and additional cistern-room should be provided in the large central tower in the administrative block.

Water-closet Blocks, &c.—The blocks of water-closets and bath-rooms should be separated from the wards by intercepting lobbies, having windows on each side, and also ventilating outlets in the ceiling, so that any tainted air coming from them would be cut off from the wards by the through current of air in the intercepting lobbies. The water-closet blocks should also contain soiled linen shoots, slop sinks, urinals (in the male blocks), water-taps, wash-basins, &c. Other wash-basins should also be placed in all the associated dormitories, in addition to those in the lavatory and bath-room blocks. The bath-room blocks attached to the wards should contain baths, lavatory basins, water-taps, filters, urinal basins, &c. There should be in every case an intercepting lobby to the bath-room blocks, similar in size and purpose to that provided to the water-closet blocks. The intercepting lobbies should not be of a less width than 5 ft. Water-closets should be provided in the proportion of one for every ten patients. The floors of water-closets and lavatories need not be of wood.

Drainage.—The pamphlet issued by the Commissioners in Lunacy, entitled "Practical Suggestions in reference to Sewerage, Drainage, and Water Supply of Lunatic Asylums," and printed by Messrs. Eyre & Spottiswoode, contains a great deal of valuable information on the construction and form of sewers and drains, and it also contains illustrations showing the form and mode of construction recommended.

Medical Superintendent's House, &c.—The residence for the medical superintendent should be entirely detached from the main buildings, or be merely connected by a corridor or covered way. It should not be situated at an inconvenient distance from the main buildings, or the efficient and satisfactory performance of the superintendent's duties would be interfered with, if not rendered impossible. It is desirable in this case, as in the other cases mentioned, to provide on the plans at the outset for the maximum requirements. To build a small house for an unmarried superintendent, who may at any time be replaced by one who is married and has a large or increasing family, would be to make an inconvenient mistake.

Chapel.—The chapel should be detached from the main buildings, and should be picturesquely treated. It should be easy of access, should have the usual character and arrangement of a church, and should be capable of comfortably accommodating at least three-fourths of the patients. There should be "no special or peculiar provision for the separation of the sexes," a centre aisle being all that is required.

Convalescent Cottages should be wholly detached from the main building, and situated in a pleasant part of the grounds, having all necessary offices for distinct and separate working, as an ordinary house has. The size and accommodation should be in proportion to that of the asylum itself. The entire separation from the general body of patients, and the change in life of the utmost benefit as a finishing process and completion of cure before the patient is sent out again into the world.

Hospitals for Infectious Diseases should be provided for every asylum. They should be entirely detached from the main buildings, and they should be distinctly self-working. They should have a dormitory, a few single bedrooms, associated dayroom and a few single dayrooms, a kitchen, scullery, and cellars (well ventilated) for stores, &c. In a block of outbuildings there should be a disinfecting-room, wash-house, drying-chamber and laundry, and a store-shed for coal and wood,—the number and sizes of the various rooms to be, of course, proportioned according to the number of patients which the asylum accommodates. The cubical space allowed for each patient should not be less than 1,500 ft.

Ice-houses.—As there are so many uses for ice in a building of this kind throughout the year, but particularly in the summer months, an ice-house is indispensable. It should be placed in a convenient position near the administrative block.

The Dead-house, Dissecting-room, and Hearse-house.—These buildings should be lighted from the roof, so that the interior cannot be overlooked from any surrounding buildings or grounds. The entrance to the dead-house should be screened by shrubbery planted by the side of the winding approach to the doorway. These buildings should be entirely detached, and should be situated in an obscure part of the grounds.

Lodges and Entrance Gates.—Each lodge should have a parlour, kitchen, scullery, and small pantry, coal-shed, water-closet, and three bedrooms. It is, however, open to consideration in certain cases whether a single-story building, containing living-room, scullery, small pantry, coal-shed, water-closet, and one bedroom, would not be sufficient.

Cost.—Unfortunately, cost is not the test of efficiency. Far more money is spent in building gigantic mistakes than would be required for providing suitable and sufficient accommodation where curative measures may be fully carried out, and where a medical superintendent may not be placed at a disadvantage by architectural shortcomings. On the contrary, the blighting idea of economy too often manifests itself, and over and over again the ships are spoiled for the sake of saving ha'portha of tar. Consider what these spoiled ships cost in the aftertime. Altering, improving, repairing, extending, em-

bellishing, rectifying, replacing. We know what these words mean, but nowhere are their meanings so fully expressed as in the accounts of asylum expenditure. In the late competition for the new asylum at Hull, the selected design was estimated to cost 56,000*l.* for 400 patients, and the design that secured the second premium was estimated to cost 46,000*l.* for 420 patients. The Asylum Committee were much troubled in their minds about this extra 10,000*l.*, and a gentleman was, or is to be, employed to check these estimates, and report to the committee. I presume that if he has the courage to predict (for a professional man's estimate just now comes almost under the head of prophesy) that the building for 420 patients can be carried out for 109*l.* 10s. a head, the committee will abandon the design which they have already decided is the best, and once more sacrifice quality for economy.

The Chairman (Mr. E. G. Hayes, vice-president), in inviting discussion, observed that Mr. Dawes had given an admirable exposition of the latest principle of planning lunatic asylums. He had referred to the asylums erected some thirty or forty years ago, and it was interesting to note the remarkable progress which had been made in the interval. There were some plans published in the *Builder* in 1846* of asylums erected at that date, in connexion with a paper read by Mr. Fowler. The leading idea in planning asylums at that time seemed to be to keep all the wings of the buildings as near together as possible, in order that they might be near to the administrative block. In one of the asylums erected at that period the administrative block is circular on plan, and the other blocks radiate from it, giving to the whole somewhat of the form of a star. Such plans as these effected the object of giving ready access between the wings and the central administrative block, but they did so at the sacrifice of light and air, which were so essential. Hanwell Asylum was an example of the more extended system of planning. It would be interesting to know what percentage of the inmates of such asylums dined in the dining-hall, and what percentage had their meals sent to them in their respective day-rooms. He believed that in some recently-planned American institutions of the kind there were no central dining-halls. In one American plan which he had seen, the whole of the patients were divided into groups of twenty or twenty-five, each block being built complete in itself to accommodate that number, with its own day-room, library, and dining-room, with a kitchen common to all the blocks, and centrally placed. With respect to the decoration of the day-rooms and other portions of the interiors of such asylums, which it was desirable to make as bright and cheerful as possible, this was a point which had much engaged the attention of medical men on the Continent, and he believed it had been found that some of the patients had been peculiarly benefited by the effect of colour. For instance, those of a melancholy turn of mind had been cheered up by being placed in red rooms, and those of a violent disposition by being placed in rooms in which the whole of the decoration was of a cool grey colour. In the new asylum which had recently been erected at Virginia Water by Mr. Holloway, the principle of sub-division had been carried out very fully, there being only three or four patients in each block; it might, in fact, be called the separate house system. In that asylum, however, the patients were of a class who could afford to pay well for the accommodation provided. He thought Mr. Dawes might add to the completeness of his paper by stating what he considered to be the average cost per patient for erecting a building of the kind he had described. The cost of such buildings used to be put at about 150*l.* per patient.

Mr. Dawes.—I should put it at that now; certainly not less.

Mr. Bowes A. Paice moved a vote of thanks to Mr. Dawes for his paper, observing that the principle of planning lunatic asylums *en échelon* was one which was well worthy of the attentive consideration of architects.

Mr. James Smith, in seconding the motion, said it was no doubt the truest economy in the long run to build well-planned and adequate asylums, with all necessary sanitary appliances of the best description.

The motion having been carried by acclamation,

Mr. Dawes, in reply, agreed with the chairman in condemning the planning of lunatic asylums with the wings radiating from the central or administrative block. Such plans, based on the form of a star or that of a horse-shoe, might look very compact and pretty on paper, but in practice they would not answer except for prisons. True it was that lunatic asylums were, in a sense, prisons, but they were prisons in which it was of the utmost importance that all the inmates should have the greatest possible amount of light and sunshine. The proportion of patients taking their dinners in the dining-hall would vary from time to time according to the views of the medical superintendent, who exercised despotic sway. In allusion to the supposed beneficial effect of colour on some patients, Mr. Dawes said he believed the benefit was really derived not from any particular colour or colours, but from the change in the patients' surroundings. As far as possible, asylums should be planned so as to give facilities for making such changes, at any rate in the case of certain classes of patients.

A CHURCH OF THE ELEVENTH CENTURY.

WE regret to hear that the Municipality of Dol, near St. Malo, have decided to pull down the ancient church of Notre Dame. Already, in 1818, this edifice lost its sacred character, and was converted into a corn-market. We do not know whether there was any very great necessity for destroying this monument, but we know there were many reasons for preserving the old church. According to the most competent archæologists, it had been built during the course of the eleventh century; and some judges have even declared that it dated back as far as the tenth century. The church was a good specimen,—in fact, the last specimen,—of the Carlovingian architecture of Brittany. Its foundation is attributed to the Count Rivallon-Chèvre Chenu, standard-bearer to the Church of St. Samson, and brother of the Archbishop of Jun-Ken, who governed the church of Dol from 1004 to 1032.

The church of Notre Dame was built in the shape of a Latin cross; its medium width was 15½ mètres, its length 46 mètres. Above the centre there was a splendid spire, which was destroyed in 1818. At the foot of the principal aisle there were two very handsome pillars of the sixteenth century which were most ably carved. Altogether the church of Notre Dame de Dol was precisely one of those rare specimens of architecture which so many tourists and archæologists hope to meet when they visit the interesting old towns of Brittany.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AT the special general meeting of members held on Monday evening last, the 8th of March, Mr. John Whichcord, F.S.A., president, in the chair, the decease was announced of the Marquis Pietro Selvatico, Hon. and Corr. Member (Padua).

The President announced, with reference to the award of the Royal Gold Medal, that no name had been substituted by the Institute for that of the gentleman nominated by the Council for submission to her Majesty the Queen; whereupon, in accordance with precedent, it was resolved to humbly submit for her Majesty's gracious sanction that the Royal Gold Medal for the year 1880 be presented to Mr. John Loughborough Pearson, A.R.A., Member of Council.

The secretary announced that he had received notice from Mr. Charles H. Cooke, F.S.A., Fellow, that at a future meeting he would ask a question relative to the award of the Pugin Travelling Studentship:—"Whether the decision rests with the Council alone without confirmation by the general body?"

MEDALS AND PRIZES.

The reports of the Council on the adjudication of medals and prizes, 1879-80, and on the subjects for medals and prizes to be competed for during the Session 1880-81 were submitted to the consideration of the meeting.

The Soane Medallion (eighteen competitors).—Resolved: That the Soane Medallion and (subject to the usual conditions) 50*l.* be awarded to the author of the design bearing the motto "Labor omnia vincit" (Mr. Edward Harnor, of No. 8, John-street, Adelphi). Resolved: That a Medal of Merit be awarded to the author of the design bearing the device of a circle (Mr. Charles E. Sayer, of 17, Soho-square). Resolved: That a Certificate of Honour be awarded to the author of the design bearing the motto "Why not?" and a Certificate of Honour to the author of the design bearing the motto "Ernst ist das Leben heiter ist die Kunst" (Messrs. Sydenham W. Richards, of Cardiff, and Frank T. Baggally, of Holme Lee, Beckenham, respectively).

The Tite Prize (five competitors).—Resolved: That the Tite Prize be awarded to the author of the design bearing the motto "Hope" (Mr. Leonard Brisbane Broun, Associate, 9, Abercorn-place).

The Grissell Medal (three competitors).—Resolved: That the Grissell Medal be awarded to the author of the design bearing the motto "Spes" (Mr. Jasper Wager, of 15, Whitehall-place).

The Institute Medal and Five Guineas: Drawings (four competitors).—Resolved: That the Institute Silver Medal (Drawings) and Five Guineas be awarded to the author of the drawings bearing the motto "Studiose diligenterque" (Mr. W. Niven, 31, Princes-square, Bayswater). Resolved: That a Certificate of Honour be awarded to the author of the drawings bearing the motto "Hilda"; a Certificate of Honour to the author of the drawings bearing the motto "Paulatim"; and a Certificate of Honour to the author of the drawings bearing the motto, "Labor omnia vincit" (Messrs. Arthur P. Gunston, of Herne-hill, Tunbridge Wells; Herbert Goodall, of Graeme's Dyke, Harrow Weald; and R. Douglas Sandilands, of 111, Bath-street, Glasgow, respectively).

The Institute Medal and Ten Guineas: Essays (three competitors).—Resolved: That the Institute Silver Medal (Essays) and Ten Guineas be awarded to the author of the essay bearing the motto "New Babylon" (Mr. George H. Blagrove, of 84, Southampton-row, W.C.). Resolved: That a Certificate of Honour be awarded to the author of the essay bearing the motto "Tudor" (Mr. T. R. Hooper, of Redhill, Surrey). Resolved that the author of the essay bearing the motto "À Cœur vaillant Rien d'impossible" be commended (Mr. Laurence Sayer, of 15 Great College-street, Westminster).

ARCHITECTURAL COMPETITIONS.

Having reference to the notice given by Mr. Thomas Porter, Fellow, that he would move a resolution requesting the Council to take into consideration the subject of architectural competitions, and appoint a committee which should report thereon, Mr. Porter stated that he had, by permission of the Council, amended the terms of his proposed resolution, and that he would ask leave of the meeting to move as follows:—

That a committee of the Royal Institute of British Architects be appointed to take into consideration the subject of architectural competitions, that shall, in concert with other London and Provincial Societies, suggest certain regulations for the conduct of architectural competitions, and report to the Council the result of their action.

After a discussion in which Messrs. C. F. Hayward, H. Dawson, Wyatt Papworth, C. Fowler, Arthur Cates, Professor Kerr, E. C. Robins, O. Hansard, and the President took part, the resolution was carried *nem. con.*, and a committee appointed with power to select their own chairman and secretary.

[In connexion with this subject, we note that a memorial, already signed by 120 architects (many of them being eminent practitioners), has been drawn up for presentation to the Council of the Institute, praying that body "to devise some scheme whereby all members of the profession can agree not to take part in any public competition unless a professional adjudicator of established reputation is appointed."]

Mr. Ewan Christian was elected vice-president, in the room of the late Prof. E. M. Barry, R.A.

Heath House School, Horsmonden, Kent.—This building has been erected for Mr. George Tabor, from the designs of Mr. William Theobalds, architect, London. It has a frontage of nearly 50 ft. The hood to the entrance-door is in Portland stone carried on moulded stone corbels. The walls throughout are hollow, bonded about every 2 ft. apart with Jennings's patent bonding bricks. The front is faced with red bricks, pointed in blue ash mortar, the overhanging eaves being supported on moulded wood brackets. Accommodation is provided for about fifty boarders. The builder was Mr. Alfred Martin, of Horsmonden.

* *Builder*, vol. iv., pp. 354, 355.

A NEW FLOUR-MILL AT CHATHAM.

A PAPER on "Flour-Mills" has been read before the members of the Civil and Mechanical Engineers' Society by Mr. H. Ellis Hill, vice-president. Having treated of hand-mills and windmills, not forgetting their archæological aspect, the author described in the order of their action the various machines and appliances which at present constitute a well-appointed modern flour-mill, and then directed attention to a large mill recently erected at Chatham from the designs and under the superintendence of Mr. Gibbs and himself for Messrs. Stedman & Wingent, of that town, who, having to remove, through expiration of lease, from one of their windmills, and requiring more accommodation and greater milling capacity, determined to erect a large steam-mill in a central position for the trade of the district, having obtained an eligible site close to the Government buildings, with a frontage to the river Medway of 120 ft., and about the same to Medway-street, and about 170 ft. deep. The design having been approved by the Watts Charity Commissioners, the freeholders of the land, working drawings and specification were prepared. It was then determined by Messrs. Stedman & Wingent, who were anxious to have a mill of the best possible character, both for materials and workmanship, to construct the building without the aid of a contractor. The building was 70 ft. long by 40 ft. wide, and contained five floors above the ground, and cellars below; adjoining was a boiler-house 38 ft. long by 24 ft. wide.

Before commencing the excavations, a timber wharf was constructed along the whole of the river frontage, reclaiming a portion of the foreshore. Excavation was then commenced and taken down to a level of 19 ft. below the road surface, or 14 ft. 6 in. below high water of ordinary spring-tides, passing through river mud and made ground and on to a strata of stiff blue clay just above the chalk. While excavating, much difficulty was experienced by the influx of water from two old 9-in. drains apparently connected with some disused sewer. The boiler-house foundations were taken down to 6 ft. below the road surface, and the whole area floated over with cement concrete. The foundations for the chimney-shaft were taken down to 20 ft. below the road surface.

The concrete throughout the work was made with Portland cement; that for the foundations and walls with seven parts of sand and shingle to one part of cement, and for the cellar floor five parts to one part. The foundations were 4 ft. deep, 6 ft. wide at the bottom, with 6 in. set-offs, and 4 ft. wide at the top. The cellar walls were 3 ft. thick throughout, and came to within 2 ft. of the road level. The foundations and walls were laid in even layers, and brought up at the rate of about 2 ft. per diem. A concrete floor was spread over the whole area, except round six concrete piers built in the cellar to carry the upper columns. The piers were 5 ft. square, brought up to the same height as the concrete walls. The height of the cellar from floor to floor of the ground-floor is 11 ft., giving large storage accommodation. From the top of the concrete commence the brick-walls of the building, 2 ft. 3 in. thick for the lower floor, and diminishing by half a brick in thickness for each floor above. The bricks are principally local yellow stocks, of good shape and colour, with Burham wire cuts for quoins and string-courses, and red brick arches. The floors are 1¼ in. thick, nailed to 9 in. by 3 in. joists, supported on 12 in. by 12 in. transverse beams. There are double rows of circular-iron columns running lengthwise along the building to support the wooden beams, the columns being 9 in. in diameter and 1¼ in. thick on the ground floor, diminishing to 5 in. in diameter and ⅝ in. thick on the upper floor. The windows are all circular-headed, with iron sash-bars and ventilator openings. The roof is of timber, with collar and inclined tie-rods to give head-room for the men working on the top floor. The principals are 36 ft. 6 in. span and 7 ft. 4 in. pitch. One end of the main building is divided from the remainder by a brick-wall from the cellar upwards, the lower part being used as an engine-house, and the upper part is divided into fire-proof rooms for special uses. On the ground-floor are fitted up the general offices, with an entrance-door from the front yard and one from the mill. The floors of the building have all been designed to carry loads equal to 2 cwt. per superficial foot.

The mill has now been in active work for about two years, and as yet there are no signs of settlement or cracks in any part of the building. The boiler-house adjoining being of one story only, and having but little weight on the foundations, was built on made ground, the excavation being carried down to 6 ft. below the ground level, and then floated over the entire area with concrete, on which the walls were built. This building has settled slightly, and shows a crack where it joins the main building. The crack is of little consequence, and would probably not have shown had it not been joined to a building which did not settle at all.

At the back of the boiler-house is the chimney, standing 100 ft. high above the ground level. It was built from the inside, entirely without scaffolding, and without the slightest accident. It has been in use almost day and night, except Sundays, since completion, and stands now, so far as can be seen, perfectly upright, and without sign of failure. The socle is 20 ft. high and 10 ft. square, the shaft is 80 ft. high, 4 ft. 6 in. diameter at bottom, and 3 ft. 6 in. diameter at top, two and a half bricks thick at bottom, diminishing by set-offs to one brick thick at the top.

The whole building has been constructed of the best materials, and with first-class workmanship. Its present capacity for grinding is 400 sacks of flour per week with five pairs of wheat stones, but provision has been made for duplicating this quantity by adding another five pairs of wheat stones, in addition to which there are at present three pairs of "Peak" stones for bean splitting, offal and barley grinding.

The machinery and apparatus at present in use in the mill, most of which has been supplied by Mr. Smith, of Carshalton, are as follow:—In the boiler-house, two single-flued Cornish boilers, each 20 ft. 6 in. long by 6 ft. 6 in. diameter, working with a pressure of 50 lb. per square inch. In the engine-house, one compound condensing beam-engine, high-pressure cylinder 13¼ in. diameter, low-pressure cylinder 22½ in. diameter, 5 ft. stroke. The condenser requires 90 gallons of water per minute, which is supplied from a well in one corner of the building, from which an unlimited supply may be obtained; the gauge shows a steady vacuum of 14½ lb.

In the mill the wheat is ground and dressed in the following manner by the various machines and apparatus. Wheat is brought by wagons to the front of the building, and is hoisted by a sack-hoist through the flaps of the "lookum" on to the top floor; this floor is kept principally for stowage. Sacks are emptied thence in proper proportions of English and foreign wheat through an opening in the floor into the smutter bin, the lower part of which is covered by a wire grid, to prevent the admission of large substances to the cylinder. From the bin the wheat falls by gravitation into the smutter, where the wheat is cleaned,—first, by riddles, which, between them, sift out anything larger or smaller than wheat; secondly, by beaters fixed on an upright spindle and enclosed in a perforated steel casing. The beaters scour the grain and drive the impurities through the perforations of the case; thirdly, the wheat is subjected to the action of a powerful exhaust-fan, which draws away any remaining chaff or dust, and blows it through an iron spout into the chimney. This machine is the American Eureka, and is capable of cleaning forty to sixty bushels of wheat per hour; the smutter is enclosed in a fire-proof room, and runs at 625 revolutions per minute. Leaving the smutter by an iron worm or creeper, the clean wheat is raised by an elevator to about 9 ft. above the top floor, and delivered into another creeper, by which it is conveyed to spouts communicating with the wheat-bins on second and third floors. Spouts attached to the bottom of wheat-bins lead into hoppers above the stones, which are placed on the first-floor. The wheat is fed through the eye of the upper mill-stone or "runner," and is ground between that and the lower bed stone, which is fixed in an iron frame. There is at present a row of five pairs of stones, with provision alongside for a similar row. The stones make 120 revolutions per minute, and are driven from the lay-shaft by bevil gearing, the lay-shaft receiving motion by a spur pinion from a spur-wheel on the crank shaft of engine. The speed of all the stones is regulated by a governor acting on a back shaft, and connected by levers to each pair of stones. Each pair of stones is enclosed in air-tight wooden cases, called "tuns." From the top of each "tun" a spout leads to a horizontal trunk; from this a perpendicular trunk rises to the top floor, and on it is fixed an exhaust-fan, making about 1,000 revolutions per minute to exhaust the hot air caused by friction of grinding to the top of the mill. With this hot air are small particles of flour, some portion of which collects in the horizontal trunk; the remainder, passing through the fan, is blown with the hot air into the "stive-room." The sides and top of this room are hung with canvas, allowing the hot air to pass through and escape out of the mill through a cowl in the roof, but retaining the flour-dust in the room. The flour from the mill-stones falls into a trunk containing a creeper, and is carried to an elevator, by which it is again taken to the top of the mill, when another creeper takes it to the end of the mill, and into the spout at the head of the flour-silk on the floor next below. The flour-silk is 36 ft. long, and dresses as much flour as can be ground by the five pairs of stones; but provision has been made alongside for putting another silk of similar size, when the remaining five pairs of stones are erected. The offal-silk adjoining is of the same size as the flour-silk, and is also of capacity sufficient for the present number of stones. On the third floor of the mill are three pairs of Peak stones from the Derbyshire quarries,—one pair used for splitting beans, one pair for barley-grinding, and one pair for grinding offal. The exhaust is not applied to either of these pairs of stones.

NEW BUILDINGS AT MERCHANT TAYLORS' HALL.

VISIT OF THE ARCHITECTURAL ASSOCIATION.

ON Saturday afternoon last a number of the members of the Architectural Association visited the buildings (now far advanced towards completion) which are being erected for the Merchant Taylors' Company as adjuncts to their hall. The new buildings occupy the south and east sides of a quadrangle measuring about 70 ft. by 55 ft., the north side being occupied by the hall, and the west side by other buildings in the occupation of the guild. The architects are Messrs. E. I'Anson & Son. The buildings are picturesquely grouped, and have high-pitched roofs covered with green slates. The walls are faced externally with Spinkwell stone, bat-tooled, Portland stone being used for the tracery and dressings of windows, &c. The new buildings will give better domestic accommodation for the officers and members of the company, the two principal apartments provided being the court-room, 37 ft. by 24 ft., by 20 ft. high, and the library, not quite so large. The court-room will have a linen-panelled wainscot oak dado, 6 ft. high, and will have a highly-enriched plaster ceiling, of late Gothic or Elizabethan character. The other accommodation provided will comprise, on the ground-floor, a doctor's-room, a waiting-room for convalescents who seek admission to the Company's convalescent home at Bognor; and, on the upper floors, apartments for the butler, and a number of dressing-rooms. Dennett's arching is used for a portion of the floors. The new buildings will be accessible from Cornhill through White Lion-court and Sun-court. A fountain will be placed in the centre of the quadrangle, which forms one of the most secluded nooks in the City. The cost of the buildings will be about 23,000*l*. Mr. George Shaw, of Westminster, is the contractor, his foreman being Mr. W. H. Hawke. The clerk of works is Mr. Biven.

Mr. E. B. I'Anson very kindly received the visitors on Saturday last, and conducted them over the building.

A Neglected Relic.—There are but few resurrection stones left in our ancient intra-mural burying-grounds, and one of the finest is at this present moment in great danger of being allowed to crumble away, as it lies without any protection in the vestibule of the church of St. Mary, at Hull. On inquiry we were informed that it stood above the gateway leading to the churchyard, and that when the house in which it was set was taken down and rebuilt, an assurance was given by the purchaser of the property that it should be duly reinstated. Instead of being restored to its former position when the premises were rebuilt, it was returned to the parish authorities, and is now in great danger of destruction, as some of the carving has already been disfigured.

THE NEW APPROACHES AT THE BLACKFRIARS PIER.

THE work of building the river wall of the approaches to the Blackfriars Pier, between Blackfriars Bridge and that of the London, Chatham, and Dover Railway Company, which has been in progress for more than two years past, has now been almost completed, and the coffer-dam which was constructed in order to carry out the work is at present in course of removal. The river wall is almost in a line with the north or Middlesex abutments of the two bridges, and a considerable space has been enclosed from the foreshore of the river, and reclaimed as "made land," which the Corporation now advertise to be let for building upon. The river wall, which is upwards of 4 ft. in width, and of great strength, is faced with blue Staffordshire bricks, with massive granite blocks for coping. The wall has likewise been built along the west side, immediately along the east side of Blackfriars Bridge, and at this point the new approaches to the Blackfriars Pier are now in course of construction. They consist of flights of stone steps, about 12 ft. in width, together with a roadway, connected with the Steamboat Company's bridge and landing-stage, which rise and fall with the tide. To the west of these again another narrower flight of steps is also in course of construction, leading down to the bed and foreshore of the river at low water. This portion of the work is being executed by direction of the Thames Conservancy Board.

The contractors for the whole of the works are Messrs. Mowlem & Co.

THE COST OF THE GREAT EASTERN RAILWAY COMPANY'S NEW STATION AT BISHOPSGATE.

AT the half-yearly meeting of the Great Eastern Railway Company, which has just been held, the Chairman, among other remarks, adverted to the large outlay which is at present being incurred in the conversion of the old Bishopsgate Station into a goods station, the estimated cost of which, when completed, is set down at over 250,000*l*. He stated that the works on the first section were in an advanced state, and that this portion of the new station was expected to be opened during the current half-year. He observed that it was an exceptionally large work, and that when it was finished the company would have one of the largest and best arranged merchandise stations in London, the goods manager estimating that when completed and in working order they would save, as compared with the present mode of working, 20,000*l*. a year. At present every truck had to be lowered from the high-level to the low-level, and raised again by horses to the high-level, so that the expense was very great. All that expense would be saved, and their position in the centre of London would give them a command of traffic which the shareholders were little aware of. The works would require a considerable amount of money, and the probability was that they would have to expend from 150,000*l*. to 200,000*l*. more before the works were fully completed. The station buildings will have a frontage to Shoreditch between 600 ft. and 700 ft. in length.

TERRA-COTTA BUILDINGS IN LIVERPOOL.

Two buildings are in progress in Victoria-street, and now advancing towards completion, which, as regards the character of material used and the style of architecture adopted, have excited attention in Liverpool. One of these buildings is that which forms the corner block at the junction of Whitechapel and Victoria-street, and which reminds one to some extent of Parisian architecture, and the other is the building which has been erected for the new offices of the *Daily Post*. The peculiarity of both is that terra-cotta has been entirely used in the case of the first building, and partially, mixed with brickwork, in the second. The terra-cotta employed in the structures has been made by Messrs. Gibbs & Canning, of Tamworth, who have recently completed the new Natural History Museum at South Kensington, London, in the buff-coloured terra-cotta, varied with bands of French grey in the same material. It was from observations made during the progress of this building that Messrs. E. & H. Shelmerdine decided to adopt terra-cotta as the material for chief use in the above buildings in Victoria-street, which have been erected from their designs. The design of the corner building (which is in buff terra-cotta) is in a freely-treated French Classic style, being divided into a series of ornamental piers on the ground-floor, with four entrances, having polished Aberdeen granite reveals; the piers merge into pilasters on the first floor, and are finished with a composite capital underneath a decorated entablature and cornice on the third floor level. The treatment of the corner, with the columns standing boldly out from the building, surmounted by the entablature, and bearing the figures of "Industry" and "Commerce," attracts the eye from below.

The clay from which this terra-cotta is made is found upon the upper surface of the coal measures, the manipulation necessary being to have the same ground to a fine powder and reduced to the consistency of plastic clay, then taken to the moulder's room and worked to the required shape in plaster of Paris moulds. We may remark that the making of the moulds and models forms a very considerable item in the manufacture of the material. After the moulding process the terra-cotta is dried in rooms specially heated by stoves and hot-water pipes until it is hard enough to be burnt. The burning is performed in a muffled kiln up to a white heat, and lasts from seven to ten days, the fires being gradually raised and lowered until the kiln is quite cool again. The straightness or obliquity of the terra-cotta is to some extent dependent upon the manner in which it is burnt.

The material is made in hollow blocks, and is filled in on the building site with concrete composed of gravel, sand, and cement in proper proportions. The points in favour of terra-cotta as a material are its durability, smoothness of surface, and, when repetition of ornamental work has been decided upon, its low cost in comparison with stone.

ST. JOSEPH'S CHURCH, BRIGHTON.

THE new Roman Catholic Church of St. Joseph, North Brighton, is situated at the junction of Elm-grove and Wellington-road. It is erected in the style of the latter part of the thirteenth century, but is at present very incomplete. When finished, the dimensions and arrangements will be as follow:—Extreme internal length from the west door to the wall of the apse, 124 ft. 6 in.; nave, 30 ft. wide, in the clear, vaulted, ambulatories at the side for convenience of getting to the seats and to the transept chapels without disturbing the main body of the congregation.

The choir-stalls will be placed in a semicircle round the apse, the eagle being placed in the centre behind the high altar, which will stand under a baldacchino square in plan, carried by marble shafts at the four angles.

The church is lofty, the windows being 30 ft. in height; and the interior height 50 ft. from the ground to the crown of the vaulting, which is constructed of white bricks with Bath stone ribs. All the constructional parts of the building inside are built in Box-ground stone. The external walls show Kentish rag work in long narrow courses; the windows, weatherings, copings, &c., are of Box-ground stone. The roof is covered with hard green slates of good colour and texture, imported from America. The contractors are Messrs. Dove Bros. The architect is Mr. W. Kedo Broder, of Pembridge-gardens. The nave alone is at present erected, but it is proposed to proceed with the chancel, transepts, and tower as soon as funds are forthcoming.

Unemployed Workmen. — On Saturday evening, at the Vestry-hall, Kensington, a crowded meeting of the unemployed labourers of the metropolis was held. The object of the meeting was to consider the existing distress and the depressed state of the labour market. The chair was taken by the Rev. J. W. Horsley, chaplain to Her Majesty's prison, Clerkenwell. The following resolution was carried:—"That this meeting begs to testify to the great distress and privation now existing among the unemployed labourers in London; distress of such an unprecedented character as cannot be successfully coped with by the existing poor-law arrangements. Therefore, this meeting earnestly appeals to all public bodies to provide employment for the distressed workmen, and further appeals to all generous people to assist in alleviating the widespread misery now existing among the labouring classes of the metropolis."

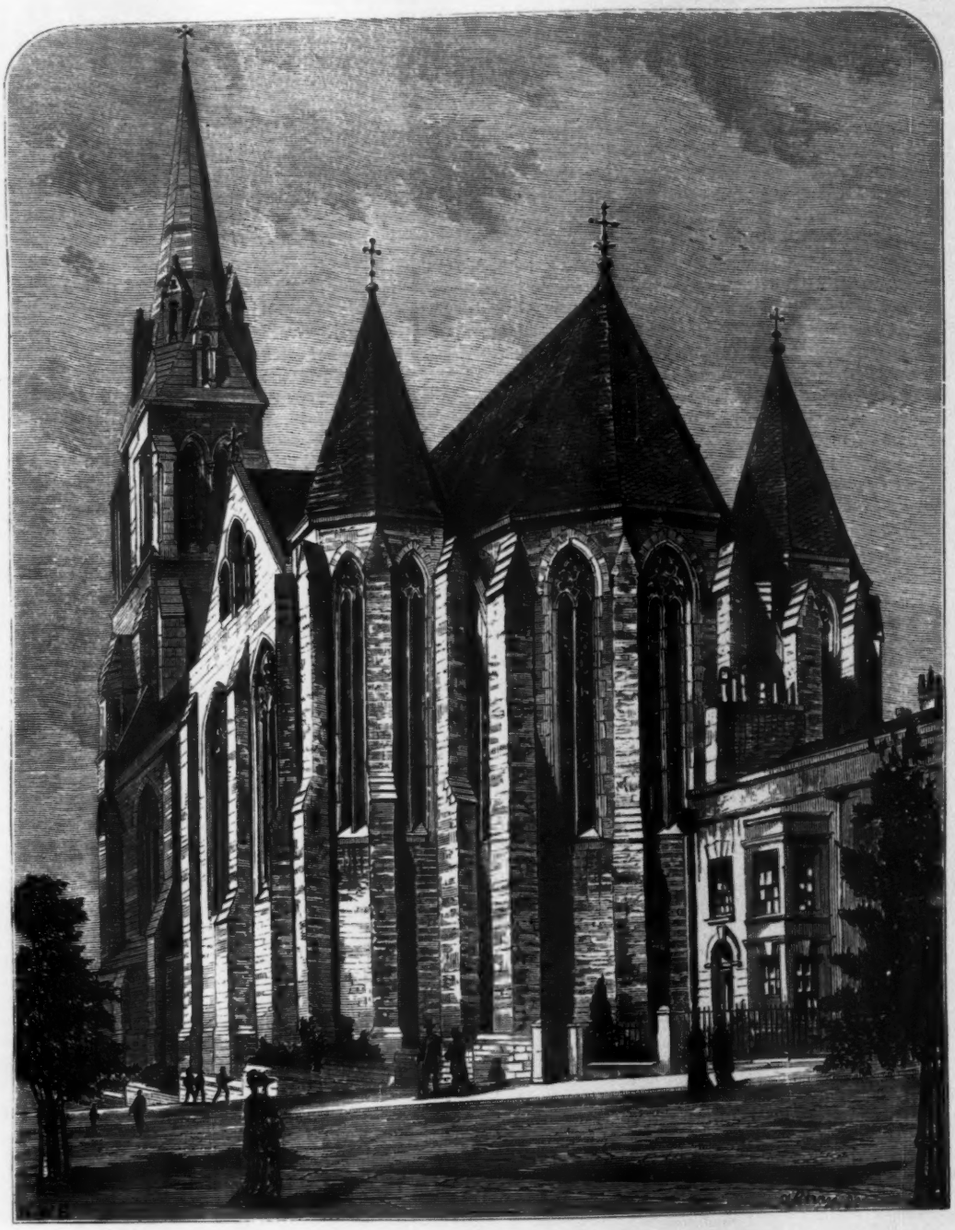
SPILSBY CHURCH, LINCOLNSHIRE.

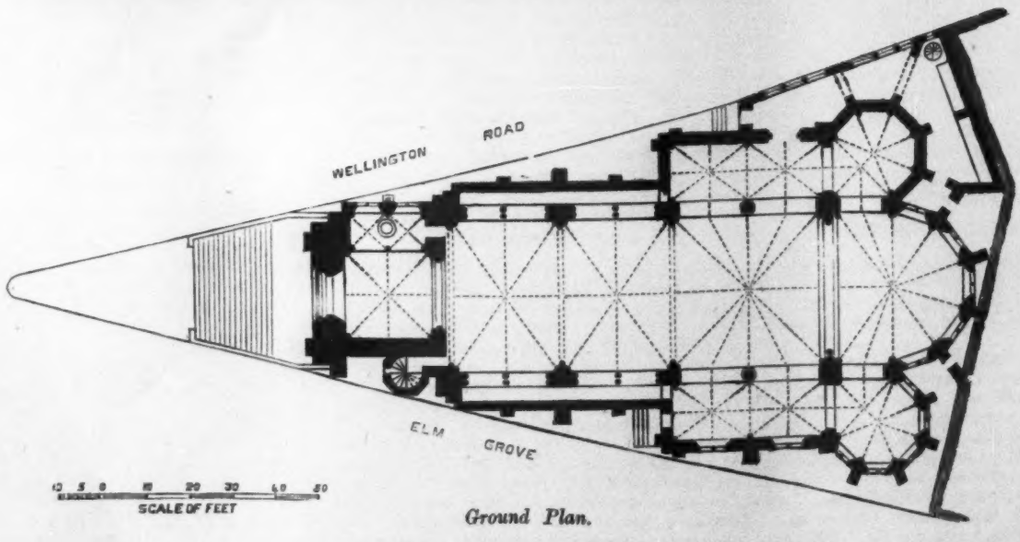
SPILSBY is a market-town in Lincolnshire, about midway between Boston and Louth. The church, dedicated to St. James, has just been restored and considerably enlarged. By reference to the plan it will be seen that the original church (built early in the fourteenth century) consisted of a nave with two narrow aisles, a chancel, and perhaps a western tower, but the only portions of this church remaining are the arcades. Late in the fourteenth century the small south aisle was taken down, and a very wide aisle substituted, with east window of five lights, and side windows of three lights, of rather uncommon reticulated tracery. In the fifteenth century the chancel, now the Willoughby Chapel, and the north aisle, were rebuilt on the old foundations, and later still the present tower was erected. In modern times galleries had been erected in the north aisle and at the west end of the nave, and as the fabric had gradually fallen into a very unsatisfactory state, it was determined to restore the old work as far as possible, and to enlarge the church by rebuilding the old south aisle, extending it westwards and adding a new south aisle, and making what was before the south aisle into the nave and chancel. This has been carried out by Messrs. Storey, of Swinstead, under the direction of the architect, Mr. William Smith, of John-street, Adelphi. The Willoughby Chapel has been almost entirely rebuilt, the old windows being restored and refixed. The old nave roof has been carefully repaired, and the north aisle has a new roof. In the Willoughby Chapel there are some very interesting old monuments. One on the north side consists of a stone altar-tomb and figures of John, first Baron Willoughby de Eresby, and Joan Roseline his wife (fourteenth century work). On the south side there is a stone altar-tomb, richly panelled, and supporting an alabaster figure of John, second Baron Willoughby de Eresby, who died in 1372, and also a larger altar-tomb, with figures of Robert, third Baron Willoughby de Eresby, and Elizabeth, daughter of Lord Latimer, his wife, all executed in alabaster. Completely blocking up the original chancel arch, there is a large monument to the memory of Richard Bertie and Catherine, Duchess of Suffolk, daughter of William, ninth Baron Willoughby de Eresby, date 1582; and against the north wall there is also a large monument to Catherine Willoughby, Lady Watson, executed in alabaster and black marble. This consists of a recumbent figure of Lady Watson (only daughter of Peregrine, Lord Willoughby) with an infant in a cradle at her feet. Behind them are two arched recesses with panels, and above the cornice there is a niche with full-length standing figure of Peregrine, her father, in a suit of half-armour, his helmet and gauntlets at his feet. This monument was in a very dilapidated condition, and it has been taken down and carefully restored and re-fixed by Mr. Forsyth, under the direction of the architect. In the floor of the chapel there are fragments of what have been some very handsome brasses, memorials of Margaret, third wife of Robert, third Baron Willoughby, and of William, fourth Baron Willoughby, and Lucy Strange, his wife. This William, Lord Willoughby, died in 1410. Altogether these monuments form an unusually interesting series. In the church there is a monument to Sir John Franklin, who was a native of Spilsby.

HOUSE AT KINGSTON VALE.

THIS house, recently completed, which is shown in our illustration, has been erected just on the slope of Kingston-hill, from the designs of Mr. T. Searancke Archer, of Gresham-buildings, London.

The materials used in construction are red Suffolk facings, Haverhill stone, and Broseley tiles, and the turret has been covered with copper. The principal rooms have been laid with parqueterie, and specially designed chimney-pieces have been supplied by Messrs. Jackson & Graham and Messrs. Lascelles,—the latter firm having carried out the principal portion of the joiners' work. Ornamental lead-lights have been used in all the upper sashes over the segmental bars, and in panels of entrance and screen doors. The hot-water and sanitary work was carried out by Messrs. Jennings. The carving was executed by Mr. Hearn. The foreman of works was Mr. Weekes.

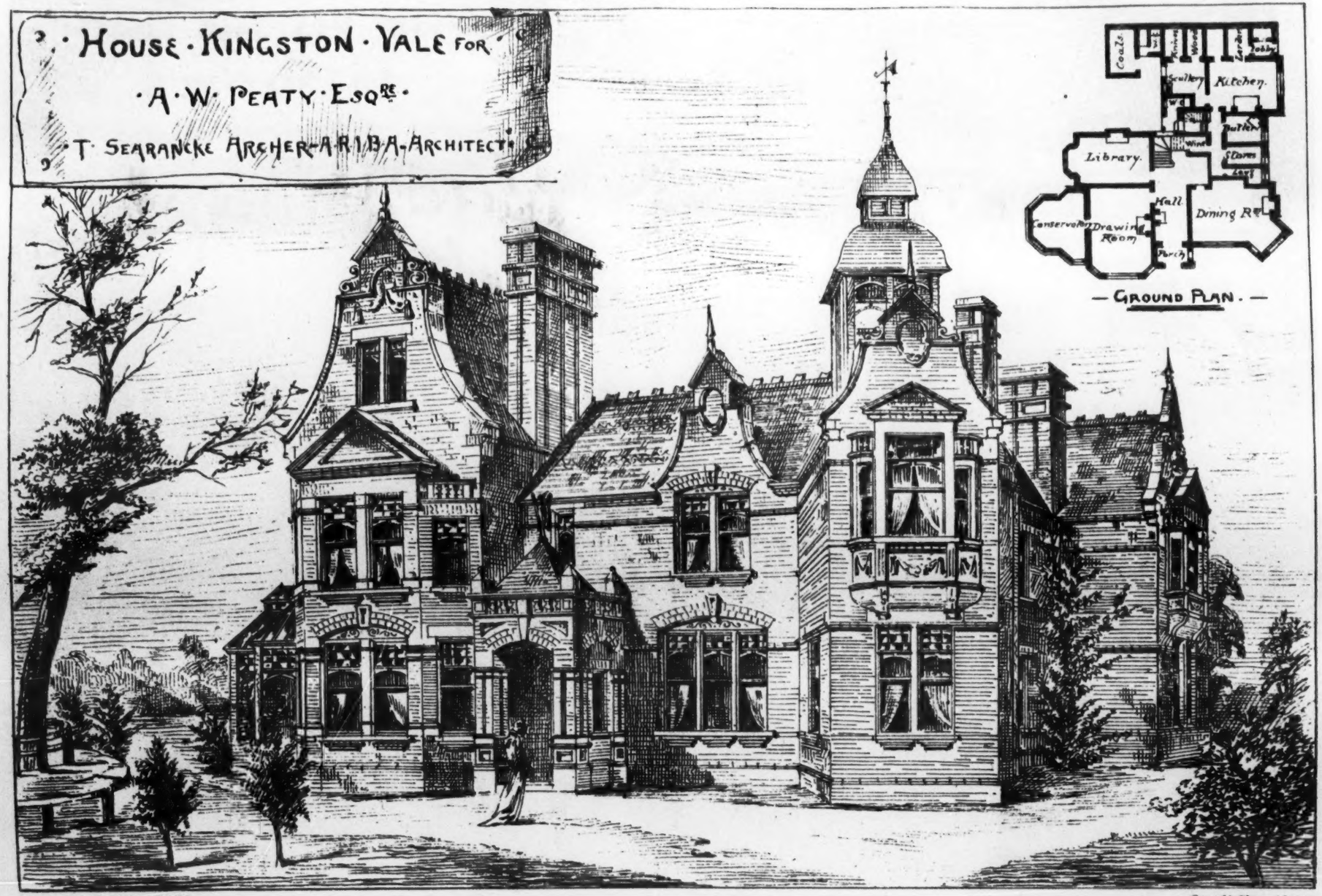




Ground Plan.

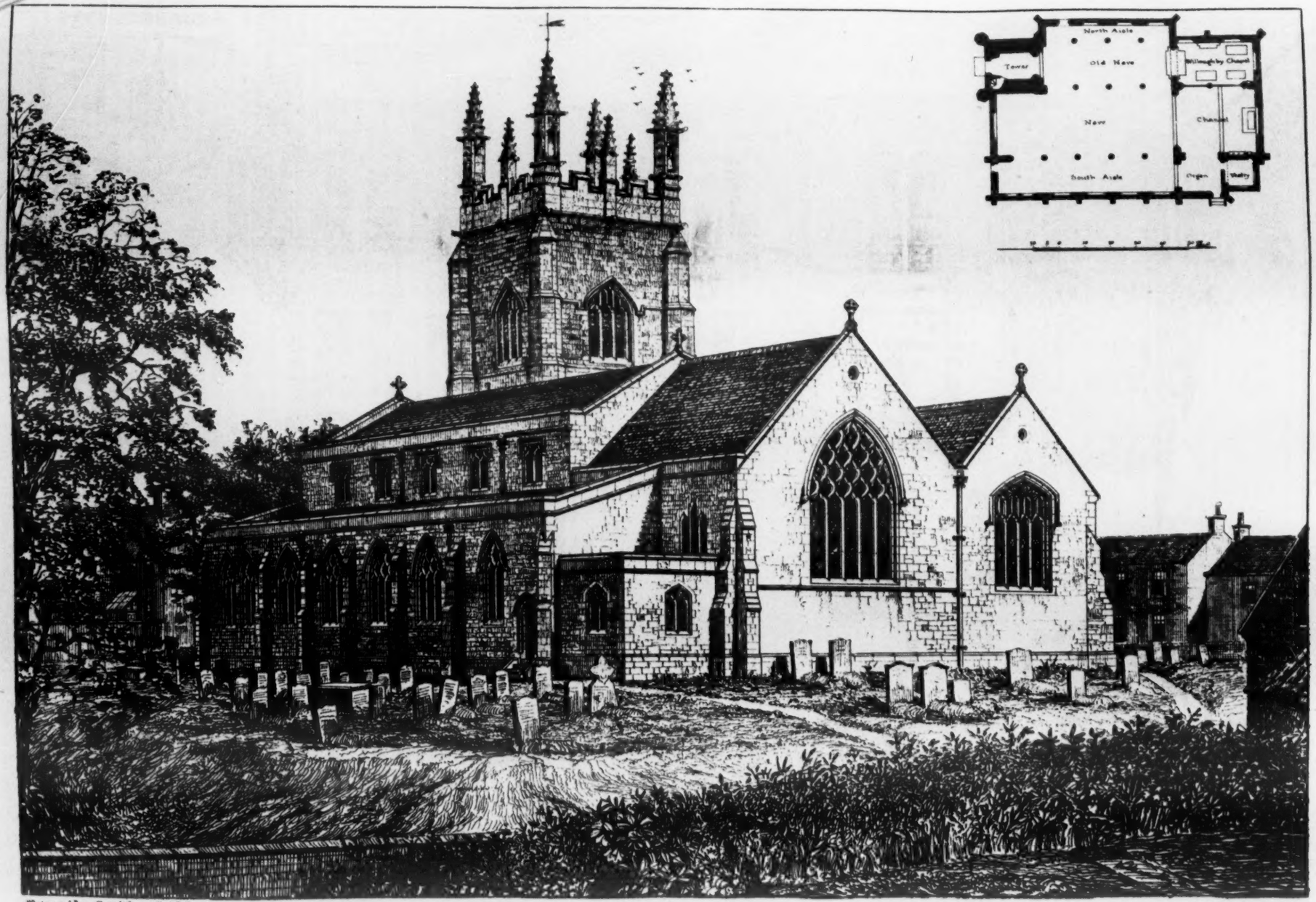
ST. JOSEPH'S CHURCH, BRIGHTON.

ST. JOSEPH'S (R. C.) CHURCH, BRIGHTON.—MR. W. KEDO BRODER, ARCHITECT.



Whiteman & Bass *Photo-Litho* 236 High Holborn

Printed by Wyman & Sons.



Whiteman & Bass, *Photo lithe* 256 High Holborn

Printed by Wyman & Sons.

ST. JAMES'S, SPILSBY, LINCOLNSHIRE: RESTORED AND ENLARGED, 1879.——MR. WILLIAM SMITH, ARCHITECT.

PRINCIPLES OF VENTILATION.

PARKES MUSEUM OF HYGIENE.

On Saturday, the 28th ult., Professor Corfield delivered a lecture on ventilation (with special reference to the ventilating appliances exhibited in the Parkes Museum of Hygiene), to the members of the Institution of Builders' Foremen and Clerks of Works, who mustered in strong force. Commencing by explaining the composition of the atmosphere, the lecturer went on to describe the manner in which it became polluted by animal respiration, the principal and most dangerous cause of pollution being, he said, not so much the extra amount of carbonic acid gas evolved, but the foul and decaying animal matter with which the always moist air exhaled from the lungs was charged. The disagreeable and unwholesome "stuffiness" of the atmosphere always experienced in over-crowded and ill-ventilated apartments, was thought by old writers on the subject to be due almost entirely to the increase of carbonic acid gas, and to the diminution of oxygen; but modern investigation had shown that the cause of the "stuffiness" referred to was due to the moisture and organic matter with which respired air was charged. In 10,000 parts of atmospheric air, there were only, naturally, 4 parts of carbonic acid gas. Now, Professor de Chaumont, in an important series of experiments, had shown that when the carbonic acid gas in the air of a room exceeded that proportion by more than 2 parts,—*i.e.*, when there were more than 6 parts of carbonic acid gas in 10,000 parts of air, the air of the apartment began to be "stuffy" and unfit to breathe; in other words, when the air of a room was found to contain more than 6 parts of carbonic acid gas out of 10,000, it would be found to be injuriously charged with moisture and foul organic matter. The quantity of carbonic acid gas in the air of a room was therefore a measure of the organic impurity of such air. It was necessary that each individual should have a constant supply of pure air at the rate of 3,000 ft. per hour; but it was not possible for each person to have that quantity of pure air when he had to spend several hours in one apartment,—as, for instance, in a bedroom, unless, indeed, the rooms were made of inordinate size, or unless,—and this was the only practicable course,—the air could be continually changed by means of ventilation. Now in this country the temperature of the external air for a great part of the year was so low that it was impossible to admit it direct through open windows or other apertures in the walls. Cold air was much denser, and therefore much heavier, than warm air, and if admitted direct into the warm apartments of our houses, it would rush in like a cataract of water, to the inconvenience and danger of the inmates. Now a knowledge of the science of ventilation enabled us to devise openings which guarded against the inrush of what might be likened to a torrent of cold air,—openings which guided and deflected the incoming fresh air, so that it might enter the apartment in the form of invisible aërial jets and spray. By such means fresh air could be safely admitted in the coldest weather without being warmed, for it would gradually mix with the internal atmosphere, and keep it pure. The lecturer subsequently called the attention of the visitors to the various ventilating appliances exhibited in the museum. Amongst these is a model showing Dr. Hinckes Bird's simple means of obtaining ventilation from sash-windows without draught, by raising the bottom sash a few inches, and inserting an accurately-fitting piece of wood underneath it, the space between the meeting-rails of the sash then allowing of the admission, in an upward direction, of fresh air. The same gentleman's mode of ventilating French casements was also pointed out, but the lecturer said that such casements were very improper windows to use in this country, by reason of the difficulty of admitting fresh air through them without inconvenience to the inmates of the room. Sheringham's valve was commended as very good and simple, but a great mistake made with it and with other appliances of the kind was that it was generally fixed too high. The proper position for such inlets for fresh air was not close to the ceiling (least of all so in lofty rooms), but a little above the heads of people when standing up,—say 7 *ft.* or 8 ft. from the floor. Theoretically the best place to admit cold fresh air was near the floor of a room; but such a plan was not practicable except at the expense of discomfort which would be unbearable and would speedily lead to the stoppage of inlets. For inlets in windows the lecturer commended glass louvres (such as Moore's patent) as very good, but they had one disadvantage in the liability of the metal movements to rust when exposed to such an atmosphere as that of London. That was a defect which would, no doubt, be remedied. Cooper's ventilator (a circular disc of plate-glass working on the ivory pivot with which it was attached to the window, and having perforated in it a number of openings corresponding in size and shape to similar openings in the windows), was a very good inlet ventilator for many positions, but inasmuch as it necessarily admitted the air horizontally instead of in a vertical direction, it had a tendency to create a down-draught, although that tendency was to some extent mitigated by the air being admitted through a number of openings instead of through one aperture. Currall's ventilator for doors and windows was noticed with approval, as were also Ellison's perforated conical ventilators for some situations. With regard to outlets, the lecturer first spoke of Dr. Arnott's well-known ventilator, which, he said, was often fixed too high. Boyle's ventilator was similar in principle, but had the flap of the valve made of talc instead of metal, thereby obviating the disagreeably-fidgeting noise which often accompanied the use of Arnott's ventilator. Wherever possible (as it generally was in building new houses), such outlets should be led, not, as at present, into chimney-flues, but into separate air-flues contiguous to them. Verity's patent air-propeller was shown at work, the lecturer remarking upon its simplicity and effectiveness. This appliance is capable of being used not only for propelling fresh air into apartments, but for extracting foul air, and Professor Corfield was inclined to think that it would be more largely used in the latter capacity. Various models of hospital windows were explained by the lecturer, notably the one used at the Middlesex Hospital and at Willis's Rooms. A scullery sink ventilator in use at St. George's Hospital, shown by a model in the Museum, was also noticed. This contrivance is very simple, consisting, in fact, of enclosing the sink between an outer and an inner casement. When the sink is not in use, the inner casement is shut down, and the act of shutting it down opens the lower portion of the outer casement, which turns upon a pivot, and thus the sink is open to the external air as well as shut off from the interior of the building. When the sink is required to be used, the lifting up of the inner sash closes the outer one. What are known as Tobin's patent ventilators (though, the lecturer said, the patent was not worth the paper on which it was printed, owing to the want of novelty in the application of the principle involved) were commended as very effective and satisfactory inlets for fresh air, and a ventilator known as "Stevens's Drawer Inlet Ventilator" was noticed as effecting practically the same end by different means. This ventilator consists of a small drawer fitted into the external wall of a building and drawing outwards into the apartment to be ventilated. At the back of the drawer is an air-brick let into the external face of the wall, and the air is admitted through the bottom part of the back of the drawer; when the drawer is pulled open the fresh air is deflected upwards by means of vertical partings or divisions fitted inside the drawer. One merit claimed for this ventilator is that it can be effectively concealed by covering the front of the drawer with the paper with which the walls are covered.

On the motion of Mr. W. Miller, a cordial vote of thanks was given to Prof. Corfield for his lecture.

On this Saturday, the 13th inst., Mr. Rogers Field will lecture to the members of the Institution on "House Drainage."

We take occasion to add a word in commendation of the Institution of Builders' Foremen and Clerks of Works, which affords many advantages to its members. Those who are eligible to join it should write to the Secretary at the offices of the Institution, No. 9, Conduit-street. Its objects are stated to be:—"1st, maintaining the respectability of its members; 2nd, obtaining information of situations; 3rd, rendering assistance to aged, afflicted, and infirm members; and 4th, making provision for the widows and orphans of deceased members." Rule 2 is as follows:—

"That the Institution shall consist of foremen of the following branches of the building trades: viz., masons, carpenters, bricklayers, plasterers, plumbers, painters, and smiths; also clerks of works who are engaged with architects, civil engineers, or others."

Candidates for membership must have been foremen or clerks of works for a period of at least two years, and must not be more than 45 years of age.

THE RECENT EXCAVATIONS AND THE SCULPTURES DISCOVERED AT PERGAMOS.

At a meeting of the British Archæological Association on the 3rd of March, Dr. Phené read a paper on this subject, and described by plans and drawings some of the more interesting antiquities in Pergamos. Amongst others, the great tumulus and its vast and intricate passages, illustrations of which were published from his drawings in 1877,* and which he looked on as the gloomy retreat and treasury of Attalus III., in his melancholy retirement. Plans were shown of the huge ruined basilica bearing the name of the Church of St. John, and supported by a round church on each side at the eastern end, each 60 ft. in diameter and each 30 *ft.* distant from the main church. These round churches are called St. John and St. Antipas. The former is still surmounted by a domed roof; the latter is now used as a factory. The Greek service is still regularly conducted in the round church of St. John. The present remains also include a fine theatre, with a stadium above it; an amphitheatre or naumachia adapted not only for scenes of the arena, but also for sea-fights, by artificial flooding; vast tunnels of masonry 200 yards long, with arches spanning 30 ft., and an elevation of from 40 ft. to 50 ft. The site of the Nicephorium, a magnificent grove containing originally temples to Zeus, Athene, Apollo, Æsculapius, Dionysius, and Aphrodite, he considered might be identified with the magnificent cypress groves formed by the Turkish cemeteries, the fertility of which, as shown by their fine trees, indicated the locality, while the numerous tombstones of rich marble, and often of antique fluted and spiral columns, showed a rich quarry of ready-made material evidently freely used. The Acropolis was, of course, the spot where the most ancient remains were likely to be found, as the monuments so far described were without the walls and were ravaged by numerous enemies, particularly by Philip V. of Macedonia. Dr. Phené had himself examined the Acropolis at one part of the ascent to which, towards the south-west, he had noticed at least sixty columns, some of granite, some of fine marble, many being built into the defences, and in having part of the *débris* removed, had observed slabs of highly sculptured work, which he considered were slabs similar to some now in the museum at Berlin. He had not paid minute attention to these, as his object was rather to trace the foundations of some of the buildings erected there, in particular the Corinthian temple, which Vitruvius calls the temple of Minerva, but from which opinion Dr. Phené dissented, as he had lately shown in a paper on Greek architecture that the Corinthian was most frequently the order devoted to temples of Jupiter, and the Corinthian capital, like the foliate crown given to the victors in Olympian games, was a crown dedicated to him. However, there was the temple, and its site is still defined, as well as other buildings, and strewn amongst the *débris* were the fragments of the magnificent frieze found by Herr Carl Humann, and now at Berlin. Independently of the fact that he was searching more for sites of ancient temples and structures than anything else, the evidence of actual Roman occupation subsequently to the Attalic dynasty, caused him to think these sculptures of later date and of Roman origin, and his power of transport having already been exceeded, and having no firman to excavate at Pergamos, he was obliged, after seeing the Greek schoolmaster, who had several marbles sculptured with serpents, &c., in good relief, to content himself by drawing the attention of societies to the importance of this site and that of Hierapolis; the more so as having lately returned from the interior he had uncovered a number of sculptured architectural decorations in other places, and he found them extensively in Hierapolis. But he at once commenced a very careful search in the museums of those countries which were in commercial communication with the Pergamene territory in the time of the Attalic dynasty, and at Naples, Avignon, and Arles found the animals which emblemed the gods introduced into their sculptures in the same

* See the *Builder*, June 16th, 1877.

NEW MUSEUM AND LIBRARY, ROUEN.—M. Louis Sauvageot, Architect.

manner, and with the same vigour displayed in the Pergamene marbles. These were all ancient, and had caused him to change his opinion, and to consider the sculptures from Pergamos of Asiatic work of the highest class, but still of the date of the first Roman occupation after the conquest by Aquilius, when Pergamos was made the capital of the new province of Asia. Dr. Phené, on producing his illustrations of these similar works, referred to his mention of some of them in the *Builder* of August 30th, 1879, and to recent papers read before the different societies, in which he argued that the schools of art in Asia Minor,—even including that of painting,—were the first in the world, and had never been surpassed. He considered the sculptures were decorations of what he must call the temple of Jupiter, and not, as seems to have been assumed, of any separate altar mentioned by Ampelius in the fourth century, unless, indeed, such was the altar of the temple, which in that case would at once identify it as the temple of Jupiter.

In conclusion, Dr. Phené described the form of the mountain of Pergamos, which, from a natural similarity, had been helped into a close approach to the serpent, and mentioned that here alone Æsculapius by his emblem, the serpent, was worshipped as superior even to Jupiter, and was called Σωτὴρ, or saviour, by the Pergamenes.

Building in Singapore.—It is proposed to build a new theatre for Singapore. During the year 1879, two new churches, a club-house, and a Masonic hall have been opened in the place.

NEW MUSEUM AND LIBRARY, ROUEN.

The town council of Rouen has rendered a signal service to learning generally, in France, by the steps which it has taken for the better preservation of the many treasures of art of which it is possessed. The deplorable conditions under which the rich artistic and bibliographical collections belonging to the city of Rouen have been preserved have occupied, for many years, the attention of the municipality of the ancient capital of Normandy. Occupying a space entirely insufficient and incommodious in the second-floor of the ancient abbey of Saint-Ouen, serving at present as the hôtel de ville, the museum and library were here pinched for room to such an extent that thousands of volumes and a large number of interesting paintings and drawings were relegated to lumber-rooms, where they were, of course, of no use to the public.

The works of art, amongst which there are a great number of the canvasses of the principal ancient and modern masters, as well as rare books and valuable manuscripts, were, moreover, exposed to constant risk, which gave rise to grave fears as to their safety, in consequence of their being crowded together, surrounded by fireplaces, chimney-flues, and *calorifères*, the pipes of which run even through the walls on which the pictures were suspended, or against which the books and manuscripts were piled up.

Anxious to put an end to such a regrettable state of things, the administration and the municipal council of Rouen decided in 1876 upon the construction of important buildings serving especially for the uses of a museum and library, and which would not only permit of exhibiting conveniently the whole of the municipal collections, but would also provide the necessary space for future enlargements of those departments.

These builings include the new museum and library combined, an illustration of which we present in this number of the *Builder*, showing, however, only the first portion to be erected, under the direction of M. Louis Sauvageot, the city architect of Rouen. The other parts are to be undertaken shortly; they will together form a monumental pile of a simple and severe style, possessing, however, a strongly-marked artistic character. The principal façade, in which the entrance to the museum is placed, points towards the Jardin de Solferino, which, having been prolonged as far as this façade, will improve the appearance of the building.

Although under one roof, the museum and the library will be entirely distinct. The interior arrangements adopted for the museum have been considered in such a manner as to facilitate a simple and rational classification of the works of art into "contemporary schools" and "ancient schools." A certain number of rooms have been reserved for each of these two great divisions, which will permit of the methodical distribution of paintings and sculptures according to the particular class of school to which they belong. The different rooms vary in size. Some of them are of great dimensions and elevation, and are destined for large canvasses, requiring longer distances for viewing them. Other rooms are less spacious, and are in the form of *salons* or galleries; they are specially intended for smaller works, drawings, water-colours, and paintings which have to be examined closely.

The question, so important for a museum, of a proper distribution of light in the rooms, has been carefully studied. The large rooms are lighted from above by means of a ceiling of roughened glass, of which the sides, inclining at a fixed angle, direct the greatest amount of light upon the vertical walls.

The smaller rooms and the galleries are lighted partly from the vertical faces of the exterior walls, and partly through the ceiling, in the same fashion as artists' studios are lighted.

Other rooms and galleries, occupying the first floor of the principal building, are appropriated to the rich and interesting ceramic collections also belonging to the city of Rouen.

As regards the library, this will comprise, in the first place, a principal room for keeping the books, serving at the same time for exhibiting the most valuable manuscripts, engravings, and objects of the numismatic art. Two separate galleries, to the right and left of the entrance, will contain exclusively the collections bequeathed to the city by generous donors.

The latter two galleries, as well as the great hall in the centre, opening direct into the vestibule, may be inspected at all times by tourists and visitors, without the least annoyance being caused to readers, for which an entirely separate room is provided.

This brief description will show that the city of Rouen is desirous of worthily preserving its rich art and bibliographical collections, which are reckoned amongst the most important and most interesting in France.

WALSALL PARISH CHURCH.

THE chancel of this church, which is all that is left of the ancient building (the tower having been rebuilt in 1775, and the body in 1821), is now being restored, under the direction of Mr. E. Christian, architect to the Ecclesiastical Commissioners, the contractor being Mr. Williams, of Cardiff. Its length is 52 ft. and breadth 19 ft., with a proportionate height. The date of its erection is very probably 1462, as there is in the town-chest in the Guildhall a churchwardens' account (believed to be the oldest in the kingdom) for that year, relating to the re-building of the parish church. This chancel presents many points of interest both to the archæologist and the architect. It had been plastered within and without, and in the north-west corner outside is a vestry, over which part of the church gallery was constructed, thus blocking up one of the original windows. In the arch which divided it from the body of the church was placed the organ. When this, which projected considerably into the chancel, was removed, and the plaster taken off, the hidden window was revealed, with its tracery all but perfect, and it is a good specimen of the Perpendicular style of the fifteenth century. The tracery of all the other windows having been destroyed, this discovery was opportune, as it enabled the architect to design the tracery for the other side-windows from it. The space formerly occupied by the east window had been filled with brickwork, which has, of course, been removed, and a window of five lights has been inserted, in keeping with the side-windows. Under the plaster at the south-east end were found the remains of the sedilia, evidently once richly canopied, and between each side window (which were eight in number) were evident traces of canopied niches. In the south wall there was a doorway (which had not been blocked up) leading to a flight of steps constructed in the thickness of the wall, and giving access to the churchyard, which, from the nature of the ground, is much below the level of the chancel. A corresponding doorway has been discovered on the north side, and also one which led by a special staircase to the crypt. In the chancel are fourteen oak stalls, the remains of a larger number, having *miserere* seats, and evidently, from the rudeness of the carving, very ancient.

Underneath the eastern end of the chancel is a massive Gothic archway, through which the pathway round the churchyard runs, the church, from the peculiarity of the site, which we shall notice directly, occupying nearly the whole width of the yard, and only leaving room for a path at the west end. In the middle of this archway is a door leading to the crypt. This is in two compartments. The first is a chamber with a simple arched roof, and is now utilised for the heating-apparatus. It is about half the length of the chancel, and at its west end is a wall pierced with two lancet apertures, which open into the second chamber, the roof of which is divided into two parts, and groined. It is very likely this crypt extended under the whole of the ancient church. There are a number of apertures on the level of the ground outside, in the first chamber.

It is intended to restore the chancel to as near its original condition as is possible from the evidences brought to light. The roof seems to have been destroyed, and a common plaster ceiling put in its place; but the new roof will be in keeping with the rest of the building. The walls are sound in the main, and, when the work is completed, Walsall may be congratulated on possessing an elegant chancel to its spacious parish church. The body of the church possesses little architectural attraction, having been erected at an unfortunate time. It, however, seats more people than any other in the diocese, owing to its extensive galleries. The font is octagonal, and lined with lead, which bears date 1712. Each face of the font has a figure bearing a shield charged with arms, among others being those of the Beauchamps, Earls of Warwick and Lords of Walsall. The position of the church is almost unique. The older parts of the town are built upon a long ridge (in some parts 537 ft. above sea-level), running nearly north and south. At its northernmost end it seems to have terminated in an abrupt and narrow cliff of limestone, and on the very edge of this the church is built, occupying nearly its whole width, so that, as before noticed, the walk round the churchyard has had to be taken under the chancel. A flight of sixty steps leads from the west door, down the face of the cliff, to the top of the High-street, and houses are erected close up to it, the attics of one having formerly been approached by a door from the churchyard. From its position the church appears, from some points, as though it stood on the tops of the houses. What we have said will suffice to show that this church possesses some points of interest worthy of attention.

ARCHITECTURAL METAL WORK.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.

MR. J. W. TONKS read a paper on this subject on the 24th ult., before the Birmingham Architectural Association, at the Queen's College, Paradise-street, Mr. R. B. Morgan in the chair. Speaking of the discovery by Layard of an iron core or support to a bronze ornament in one of the ruins of ancient Nineveh as probably the earliest known instance of the use of iron, the lecturer traced the development of the use of the metal, especially in relation to architecture. Having referred to the constructive uses of ironwork in architecture, the lecturer went on to describe the growth of the art of the metal-worker in the Middle Ages, when it attained to such great perfection, and offered a series of suggestions as to the mode in which that art could be restored. In saying this he was quite satisfied that individual specimens of work equal to anything in the Middle Ages could now be produced. But the great difference now is that this work is so costly as to be but a luxury of a few, while in the Middle Ages the ordinary worker in metals had a taste for and love of his art, so that even simple and ordinary specimens had a form and treatment which were both beautiful. Taking as a leading example a royal chair in silver, covered with groups of figures, now in South Kensington Museum, the lecturer dwelt on its fitness for the palace in which it was originally placed. The lock of the cathedral door and the verandah of the Renaissance mansion were in harmony and in close relation to the style of buildings to which they were attached. The comparison of such examples with the general ironwork of modern buildings was unfavourable to the latter, and the question then arose how it was to be remedied. The architect must meet the demands of the public for buildings economically constructed, but Mr. Tonks believed that they could yet do much in guiding their clients in matters of taste and beauty. The Italian architect was a Grand Maestro, who followed the fortunes of an edifice from plan to finish, often decorating important parts of it with his own hands. There was room for the architect to assume a similar position now. He could not, indeed, be expected to be painter and sculptor also; for the range of modern life forbade it, but he could claim the supervision of the details of metal-work as the most valuable elements of finish to his style. If he were thus supreme in these so-called minor details, a demand would soon arise for a more general display of art in the minor ornaments and fittings. If the demand were thus created, the supply would soon become cheap and abundant. The worker in metals would be released from the drudgery in which he is now involved, and a spirit of delight in the art and beauty of his work would spring up within him. Here was a great field for the architect, and if he earnestly entered upon it the buildings of the next generation would be distinguished from many of the present as having iron supports always sound and turned to purposes of beauty, while delicacy of style and the most intricate loveliness of detail would be found in the fittings and ornaments of metal work, which would thus complete the conception of a building by an architect who was a master in his art.

A discussion followed the reading of the paper, Mr. Henman, Mr. Reading, Mr. Osborne, Mr. Hughes, and Mr. Morgan being the speakers.

THE CONVERSION OF THE ROYAL EXCHANGE BASEMENT.

INTRODUCTION OF THE ELECTRIC LIGHT.

THE works which have for some months been in progress for converting the basement vaults of the Royal Exchange into an immense saloon coffee tavern, by the National Coffee Public-house Company, are now almost completed, and the establishment is intended to be opened for business in about a fortnight. In what is called the great central hall, over the whole of which an ornamental parquetry floor has been laid down, the electric lighting apparatus is in course of construction, it being intended to illuminate the whole of this part of the establishment by the new method of lighting, whilst the several private dining and other apartments,—upwards of forty in number,—which have been formed on either side, extending along the entire length of the basement area, will be lighted with gas. The electric light has been introduced in the spacious central saloon, with the double object of producing the greatest amount of illumination, and, at the same time, minimising the heat which would have been caused by the necessary use of gas throughout the day. In consequence of the continuous use of artificial light being obligatory, the ventilation of the whole of the extensive underground area has been provided for by the erection of a powerful engine and fan at the south-east corner, and which is intended to be constantly kept in motion. The entire face of the vaults above the flooring is in course of decoration by Mr. Howe, decorator, of Forest Hill, the surface having been first prepared for the purpose by the silicate process. It is computed that the central area is sufficiently large to accommodate a dinner party of 1,000 persons.

CLEANSING WATER MAINS.

A REPORT on cleaning the Consett water mains, addressed by Mr. Edward Dodds to the chairman and directors of the Local Waterworks Company, shows very forcibly the necessity for such work. One paragraph will suffice to prove this:—"Scraping operations were begun on the 17th of January, at Honey Hill, the junction of 18-in. and 12-in. mains. The 12-in. pipe was cut for the purpose of fixing hatchbox to insert the machine, and was found to be very foul, being reduced 1 in. in diameter, caused by deposit on the inner surface of the pipe. The machine was placed in the main on the morning of the 18th, and passed to Horsleyhope, a distance of about one mile, in seven minutes, carrying with it to the outlet an immense quantity of deposit, described by the man told off at this point, as resembling a huge black pudding, which continued to pass out of the pipe in a compact mass for over one minute; some lead was also carried by the machine and delivered here." The whole length of the main was found to be in an exceedingly foul state from deposit on the inside of the pipes, which must have reduced the delivering capacity to a serious extent. Since the completion of this work the increased daily delivery is 500,000 gallons.

Brighton.—The Spring Exhibition of Modern Water-Colour Drawings in the Pavilion was opened to the public on Monday last, the 8th inst.

SOCIETY OF LADY ARTISTS.

SEVEN hundred and fourteen works attest the industry and ambition, at any rate, of the ladies who support this institution, and a fair proportion of that number show their ability. What is most felt is the absence of really fine works, the more eminent members themselves, if they achieve a particularly good picture, keeping it back for a chance at the Academy or the Grosvenor. In the dearth of telling centres a better place might have been given to a powerful head by Theresa Schwartze, now hung in a corner. The Landseer of the Society, Miss L. Burgess Swift, well supplies one centre with a "Champion" (864), not to mention some smaller specimens of her art; Mrs. Backhouse is a valuable contributor; and Mrs. Marrable, as of yore, sends some charming representations of Italian scenery,—"Noon-day in the Villa Wolkonsky, Rome" (67), is especially good. The daughter of this lady, Miss Edith Marrable, shows a good advance in "A Decorative Panel" (667). Mrs. Emma Cooper holds her own with a case of charming miniatures, which includes a delicate piece of illumination. "Farmyard at Great Marlow" (76), Maud Naftel; "Holy-street Mill" (86), Grace H. Hastie; "The Dying Year" (114), Mary Forster; "Flowers and Fruit" (177), Emma Walter; "Walmgate Bar" (187), Louise Rayner; "Cottages at Dartington, Devon" (411), Marian Edwards; and many others, will well repay the attention of the visitor. Miss Theresa Thornycroft sends several pictures, including a more than usually ambitious attempt titled "Dives and Lazarus" (303), and Mrs. Louise Jopling, Mrs. Val. Bromley, Mrs. Croudace, Miss R. Coleman, Miss Claxton, Miss Gastineau, Mrs. Melville, Miss Montalba, Mrs. Naftel, Miss Starr, Miss Alice White, and other known artists, are amongst the contributors on the present occasion.

ARCHITECTS' BENEVOLENT SOCIETY.

THE thirtieth annual meeting of this society was held on Wednesday last, at the rooms of the Royal Institute of British Architects, Conduit-street, Mr. T. H. Wyatt, president, in the chair. The following is the annual report:—

"The reports which your Council have for the last few years been obliged to issue to your members have been of a somewhat depressed nature, disappointing as regards the result of their appeals in aid of this deserving charity; but they trust that the worst has passed, and that under the happy amalgamation of the Society with the Royal Institute of British Architects, a warmer interest may be taken in the prosperity of our Society, and in its ultimately occupying the same sort of relative position that the Benevolent Society of the Institution of Civil Engineers does to that body. During twenty-eight years we had but two legacies, and those only for 220*l.* In the last two years we have had 1,100*l.* bequeathed to us. In 1878 an appeal was made to the profession, which resulted in a gain to the funds of the Society of 489*l.* 12*s.*; and last year, acting on the generous proposal of Mr. George Godwin (in answer to an appeal made by Mr. Mocatta, chairman of the meeting held on the 12th of March, 1879) an attempt was made to raise a sum of 1,500*l.* in fifteen donations of 100*l.* (Mr. Godwin subscribing the first 100*l.*). The Council are glad to report in this, their first official record of their proceedings for the last year, that the appeal has been so far successful that the sum of 1,616*l.* 10*s.* has been received and duly invested. So that in the course of the last two years we have added 3,206*l.* 5*s.* to our invested property, and stand possessed of 5,249*l.* 13*s.* 4*d.* "New Three per Cents. Reduced," a sum which, we trust, will, under all circumstances, be dealt with as capital, the interest of which shall alone be distributed in aid. The Council have to announce that since their last report was issued there has been a gain of seventeen new subscribers, and of six subscribers who now give two guineas instead of one. The working expenses amounted to 85*l.* 17*s.*, being an increase over those of last year of about 10*l.* This is a larger sum than is satisfactory to your Council, but they have every reason to hope that under the new arrangement this expenditure may be brought under more satisfactory proportions to the income. 355*l.* was given to twenty-eight applicants, leaving a balance of 60*l.* 12*s.* 4*d.* in the hands of the treasurer. During the past year three annual subscribers have died, and seven have discontinued their subscriptions."

The balance-sheet, duly signed by the auditors (Messrs. James Edmeston and D. Cubitt Nichols), was presented by the treasurer, Mr. G. J. J. Mair. It showed that during the past year the income amounted to a gross total of 3,004*l.* 9*s.* 4*d.*, including 90*l.* 1*s.* 2*d.* dividends on stock, 27*l.* 11*s.* 3*d.* balance in banker's hands as per last balance-sheet, 323*l.* 3*s.* subscriptions, 1,603*l.* 13*s.* 11*d.* donations, 1,000*l.* legacy by the late Mr. John Johnson, and 50*l.* 1*s.* 2*d.* brought from Pension Account. The expenditure amounted to a grand total of 2,943*l.* 17*s.*, being made up of the following items, viz.,—cash paid to annuitants, 40*l.*; balance of Pension Fund carried to general account, 50*l.* 1*s.* 2*d.*; printing, stationery, writing, collecting, and petty cash expenses, 85*l.* 17*s.*; purchase of 2,580*l.* 13*s.* 1*d.* of stock (New "Three per Cents"), including brokers' commission, &c., 2,503*l.*; and cash gifts to applicants, 355*l.*, leaving a balance in hand of 60*l.* 12*s.* 4*d.*

The report and balance-sheet were agreed to *nem. con.*

The President, Treasurer, and Trustees (Professor Donaldson, Mr. Street, and Mr. Charles Barry) were re-elected.

Messrs. John Whichcord, H. Currey, A. Cates, H. L. Florence, and J. H. Good were elected Members of Council, in the room of Messrs. F. Chancellor, G. Godwin, L. H. Isaacs, G. Scamell, and H. Saxon Snell, who retired by effluxion of time.

Mr. T. Worthington (Manchester) and Mr. J. Honeyman (Glasgow) were elected Local Corresponding Members of Council.

Mr. W. H. White was formally elected Hon. Secretary of the Society; and Messrs. Charles Fowler and G. Scamell were elected auditors for the ensuing year.

A CORRECTION.

SIR,—In January, 1875, Mr. J. J. Stevenson read a paper to the Royal Institute of British Architects, in which he criticised with some acerbity certain opinions I was supposed to hold with regard to the practice of architects and the prospects of the profession generally. As he gave no references to any of the paragraphs on which his accusations were founded, I was at the time a good deal puzzled to know how much of the ill-feeling displayed on the occasion was owing to anything I was supposed to have said or done, and how much may have arisen from the tone of certain articles which appeared about that time in the *Quarterly Review*, and which were then attracting considerable attention.

In consequence of this ambiguity, I wrote a letter, which appeared in your columns on the 16th of January, 1875, disclaiming, in the distinctest possible terms, the opinions erroneously attributed to me, and repudiating the views and opinions of the writer of the articles in the *Quarterly Review* as utterly at variance with anything I had ever thought or said on the subject.

There the matter has rested for five years, and, I thought, was forgotten; and I am consequently not a little surprised to find the following paragraph in Mr. Stevenson's recently-published work on "House Architecture." After reiterating, in the same acrid manner, his objections to what he believes to be my views, he says (vol. i., p. 79), "These opinions of Mr. Fergusson were re-stated in three articles in the *Quarterly Review*, entitled 'The State of English Architecture,' April, 1872, 'The Completion of St. Paul's,' Dec., 1872, and the 'Hope of English Architecture,' Dec., 1874." As Mr. Stevenson has thought it expedient to repeat this statement five years after my explicit denial of its correctness, I wish to be allowed, in your columns, to repeat that my opinions are not re-stated in the *Quarterly* articles, but opinions diametrically opposed to any I ever entertained since I became a writer on such subjects.

If Mr. Stevenson does not know who is the writer of the articles in the *Quarterly Review*, I venture to say he is the only person interested in the subject who does not. This being so, if he will only take the trouble to find out, and will publish his name, he will do a much greater service to the cause of architectural criticism than by attempting to fix the responsibility of them on JAS. FERGUSSON.

Langham-place.

A Cathedral for Lahore.—An appeal is now being made to English Churchmen for the establishment of a cathedral at Lahore.

THE PROPOSED OVERHEAD RAILWAY AT LIVERPOOL.

AT a meeting of the Mersey Docks and Harbour Board, on the 26th ult., the Works Committee reported that they had had under consideration a letter signed by W. B. Forwood, T. H. Ismay, and others, urging the importance of the proposed overhead railway being at once constructed, and inquiring whether the Board would entertain an offer to construct the line and work it for the Board, or to grant a lease of the line after it had been constructed. The committee recommended that the writers of the letter be informed that, although the committee had not been able to bring up a definite recommendation to proceed with the work, they had no idea at present of abandoning it, and were not prepared at present to entertain any offer to carry out the scheme outside the Board. The committee stated that they had received much information, obtained by Mr. Lyster, jun., during his visit to New York, and also an important report from the Board of Trade inspectors of railways setting forth their views with regard to the details of construction; but it seemed to the committee that, in view of the very large advance which had taken place in the price of iron and other materials, it might be a question whether the present was an opportune time for commencing the work.—Mr. Lyster said the working plans, specifications, and all matters in connexion with the letting of the contract, were fully prepared some six weeks ago. The plans were then taken to London, where an interview was held with the chief officer of the railway department of the Board of Trade, and after a fortnight or three weeks that department communicated their views to the secretary. The report of the committee was adopted. The cost of the proposed works is 400,000*l.* or 500,000*l.*

MANCHESTER MATTERS.

The Utilisation of Refuse.—On the 23rd ult. a number of Cheshire farmers inspected, by invitation of the Health Committee of the Corporation of Manchester, the Sanitary Works which have been established by the Corporation on the banks of the Medlock, at Holt Town, a distance of about a mile and a half from the city. What is known as the pail system is almost universally adopted in Manchester, out of 60,000 closets there being only 300 on the old midden plan, and it is expected that these will also be converted into pail-closets before long. The contents of the closets amount in twelve months to about 190,000 tons. The works cover an area of six acres, and were recently constructed at a cost of 100,000*l.* for the Health Committee. The pails are collected and conveyed to the premises in vehicles specially built for the purpose. The contents are poured into a screened hopper, from which they fall into a machine where they are sifted, the solid substance being separated from the liquid. The latter is conveyed into tanks, where it is mixed with the blood and flesh of dead horses, dogs, cats, fish, a small proportion of bones, slaughter-house garbage, &c., all ground by a specially-constructed mill into a pulpy mass. There is also added a quantity of acid, for the purpose of fixing the ammonia. These are all the ingredients used in the process. The liquid is next dealt with in the concentrating machinery, the watery portions being driven off, condensed, and utilised in the boilers. The solid material left in the concentrator is removed at frequent intervals, and taken direct to the disintegrators and sacking-machine, where it is reduced to a fine granular form, and packed in bags ready for despatch to farmers. For the purpose of securing uniformity of quality, as far as possible, an analysis of the manure is made daily, and the following is stated to be the mean result:—Organic matter and salts of ammonia (containing nitrogen 2·97 degs. equal to ammonia 3·61 degs.), 27·74; sulphate of lime, 8·09; phosphoric acid (equal to brebasic phosphate of lime, 5·01), 2·43; alkaline salts, 2·32; oxide of iron, 13·17; alumina, 6·54; insoluble silicious matter, 18·78; moisture, 20·93. The quantity of this manure recommended for every statute acre of grass, clover, cereals, or root crops, is about ten tons; but less may be used on good soils. It is stated that with this dressing the crops will not be forced, and the fertilising properties of the manure will not be exhausted during the first year. It is delivered at any railway or canal station in Great Britain in

quantities of not less than two tons at 3l. per ton. About 350 tons of liquid is the daily supply, and this is reduced to 37 tons of concentrated manure, and 110 tons of calcined material. The ashes and other contents of the ashpits are not used in the manufacture of the manure. The ash, on being discharged from the vans, is run down a shoot into a machine which screens it, the dust being separated and carried away. The coarser stuff falls through another shoot to the ground floor fronting the boilers, where it is used for fuel. The solid refuse from the pails is also consigned to the furnaces; so that for ten boilers only a few tons of coal a day are used. The calcined fuel is ground with lime into mortar, and sold to builders. The dust from the ashes is the only substance that is not utilised, and the Corporation have to pay from 1s. 4d. to 1s. 6d. a ton to get rid of it. The premises include workshops, farriery, workmen's dining-hall, laboratory, sack and sample rooms, offices, engine-houses, &c. These works take only half the refuse of Manchester. It is proposed to erect a similar manufactory in Water-street to meet the requirements of the other half.

A Proposed Grand Hotel.—It is proposed to convert the large warehouse originally built for Messrs. Collis & Co., in Aytoun-street (illustrated in the *Builder* for 1868, pp. 640, 641) into a monster hotel, from plans prepared by Mr. W. Dawes, architect. The estimated cost of the works is 40,000*l*. The warehouse was erected from the designs of Messrs. Mills & Murgatroyd.

New Business Premises, Market-street.—New premises, with a frontage of 120 ft., to Market-street, have lately been completed, and opened by Messrs. Lewis & Co., of Liverpool. The premises extend back for a distance of 66 ft., and, including the basement and sub-basement, consist of seven floors. From the description given in the local papers, the establishment appears to be another "Whiteley's." Messrs. Horton & Bridgford are the architects.

FROM SCOTLAND.

Kilmarnock.—Considerable briskness is reported to exist in the building trade here. John Finnie-street is being rapidly built up on the one side. Besides the large premises to be occupied by the Co-operative Society, and which are partly in that street and partly in John Dickie-street, there is a large block of dwelling-houses close to the Opera-house, and well forward, and another block close to the Post-office buildings. Union-street will soon be entirely built, and the southern extension of South Hamilton-street is nearly filled with cottages.

Blairgowrie.—Messrs. Anderson, Chapman, & Co. have commenced alterations and extension of their writing-chambers. Mr. D. Butchart is mason; Mr. Thomas Steven, joiner; Mr. W. Craigie, slater; and Mr. Wm. Panton, smith. Mr. Lake Falconer is the architect.

Edinburgh.—During the adjournment of the Court of Session, a very fine carved oak fireplace has been erected in the west side of the large hall in Parliament House. The structure is of black oak, and is a good specimen of Italian woodwork of the seventeenth century. It has been erected by Mr. Alexander Robertson, advocate, one of the Sheriff-Substitutes of Forfarshire, as a memorial of his late father, Lord Benholme, and his grandfather, Lord-President Hope. Brought from Italy some time ago by Mr. W. Adams, of Queensferry-street, the chimney-piece is a notable specimen of design and workmanship. It stands 13 ft. high, with an extreme width of 10 ft. The fireplace opening, which measures 4 ft. square, is fringed with a richly-carved moulding, while each of the jambs presents a full-length view of the Virgin, holding the Child in her arms, set in bold relief upon a pedestal whose front panel is occupied with an Evangelist carved in low relief. The lintel has a central panel, with a bas-relief of the Annunciation, the remainder of its surface being enriched with scroll ornament intermixed with Cupids. The figures forming the jambs serve as caryatides to support a mantelshelf, which projects about 1 ft.; and above this the jambs are carried up, in the form of panels, about 12 in. high, enclosing sacred subjects, the intervening space over the lintel being cut up into richly-decorated spaces. Then comes another projecting shelf, upon which again rests the crowning attraction of the design, in the form of a series of reliefs, the central one of which is a large panel presenting the subject of Christ laying his injunctions upon Peter.

MAINTENANCE OF ROADS: EXTRAORDINARY TRAFFIC.

WILLIAMS *v.* DAVIES.

THIS case, in the Queen's Bench division, raised a curious question as to what is to be deemed "extraordinary" traffic under the Locomotive Act of 1878, justifying a special and extraordinary charge upon parties conducting such traffic. It had arisen in this way:—The Act (42 Vict., c. 77, s. 23) provides that where, having regard to the average expense of repairing the highways, extraordinary expenses have been incurred by reason of damage caused by excessive weight or extraordinary traffic thereon, the local authority may recover in a summary manner, from any person by whom the extraordinary traffic has been conducted, the amount of such expenses as can be proved to have been so incurred. The facts in this case were these:—

The defendant, a timber merchant, had bought a quantity of timber down in Herefordshire, and had carried it away in the ordinary manner, there being sixty-seven loads of it, which varied from two or three tons up to five tons a load, five tons being the maximum weight of the load. The carting of the whole quantity took about three months, and as the effect was, in the opinion of the highway authorities, to cut up the roads very much, they instituted proceedings under the Act, in order to recover the extra expense alleged to have been thus incurred in repairing the road, and they accordingly recovered the amount, a sum of about 20*l*. The defendant appealed against the decision.

Mr. Wills, Q.C. (with Mr. Clay), argued for the defendant, who appealed, urging that this was not "extraordinary traffic."

Mr. Justice Lush, however, observed that it seemed a question of fact, for "extraordinary" simply meant something beyond what was ordinary, and that surely was a question of fact. What would be thought an "extraordinary" traffic?

Mr. Wills.—Carrying Cleopatra's Needle, perhaps?

Mr. Justice Lush.—Or a wild-beast show?

Mr. Wills.—Probably.

Mr. Justice Lush.—But these are rare occurrences, and the enactment could hardly have been framed with reference to occurrences so rare. Surely it has reference to any traffic of greater weight than ordinary?

The Court, without calling on Mr. Reed, who appeared in support of the order, gave judgment, on the grounds already indicated, against the appellant, upholding the order making him liable. There was no legal difficulty, they thought, in the word "extraordinary," and it was a pure question of fact.

Appeal dismissed.

THE LATE MR. WILLIAM ASPDIN.

SIR,—In recent papers on "Portland Cement" in your journal, there is no mention of Mr. William Aspdin, the inventor.

His career being a sad one, it may not be inopportune to state what little we know. His confidence in his invention was great,—so great that it caused his ruin. Before the material had become thoroughly understood,—a certain success,—he launched out by renting several acres of land near Gravesend, and commenced building Portland Hall, in such an elaborate and artistic manner as to require some 40,000*l*. to bring it to a completion. When the structure was rather more than a third up, he had to stop, and he sold off at so great a sacrifice that he left the country and died abroad.

His widow wrote, saying she kept a small school, and was in great need, but omitted her address: so nothing could be done for her.

S. F.

HUTS FOR THE NAVVIES.

SIR,—On a new line of railway now in course of construction (connecting Hayward's Heath with Horstead Keynes, East Grinstead, &c.) for the Brighton and South Coast Company by Mr. Firbank, contractor, are some huts erected for living accommodation of the navvies working on that line.

Some few years ago I saw in the *Builder* views with descriptions of cottages in different parts of England in which were housed tillers of the soil, and I can vouch (by my trade) that your denunciation of the same has borne good fruit in providing more comfortable habitations for our agricultural labourers in this county. Pray come and visit these huts, of which I have spoken; do the same for our navvies, for many are the numbers sleeping in them,—in some both by day and night. Meagre is the accommodation, wretchedly are they constructed, and frequently are the services of a doctor required by their inmates.

I will take you the round of the several lots of huts, and, if desirable, introduce you to ladies, clergymen, and others, whose philanthropy has taken a lively interest in the amelioration of the sad condition in which the navvies are placed, and who, I feel sure, could a "tale unfold" truly appalling and disgraceful for any century, leave alone this, the nineteenth, of much vaunting, boasting civilisation.

THOS. WRIGHT.

THE EDUCATION OF THE WORKMAN.

SIR,—A writer, in his conceit, is perhaps too ready to believe that the reader will not fail to recollect all that he has written upon a subject to which he has devoted considerable attention, more especially when that subject is his own; for nothing was ever said about technical education prior to my proposal to the Royal Commissioners for the establishment of a Central Technic College in 1851, a project of which I have some of those Commissioners' written approval.

Your correspondent, "Observer," takes my words, "let the workman educate himself," which were obviously used in opposition to the threatened unconstitutional interference of the *dilettanti*, literally and absolutely, and as if I had not been director of the art classes at the Working Men's College, or written and lectured upon general and technical education, or suggested measures of educational reform. Only a few weeks since there was a letter of mine in these columns suggesting the establishment of shops for the training of apprentices, and papers of mine, of some length, have appeared in this and other journals on the education of the workman and the organisation of education.

I have at least a right to expect, in an argument of this kind, that my views shall not be misrepresented. I did not say, as "Observer" states, that "the masters had no more right to tell the workman what he ought to do," &c., I said nothing of the kind, but that the *dilettanti* or outsiders had no more right. I maintain that the *dilettanti*, in their haziness upon the subject of technical education, confound the education required by the master or brain-craftsman with that required by the artisan or handicraftsman,—two entirely different and distinct functions. I have never at any time attempted to separate the interests of masters and workmen; neither is there in my letters or lectures anything which would give the slightest colourable pretext for saying that I may probably have forgotten that many of the men of whom England has to be proud rose from the working class." I have not only not forgotten this, but I have made it the ground of one of my strongest arguments that your technical projects are entirely a work of supererogation, and against meddling with the education of that class which has supplied England with the men of whom you profess to be so proud. Moreover, I will affirm that "workmanship" is one of England's strongest points,—one in which she stands pre-eminent amidst the nations; and yet your *dilettanti* persist in treating the master and workman as if they were incompetent to manage their own affairs, and when so many other affairs are in a distressing state of inefficiency.

I have not only endeavoured to show that the quantity and quality of the demand must ever be the chief factor in promoting technical skill; but I have also suggested several projects for constitutionally promoting excellence in workmanship.

1. That the School Board schools should be made the preparatory schools for technical skill. I have not only proposed this, but shown how it should be effected.

2. That the provincial art-schools should be made science and art schools, or working-men's colleges, where an artisan, at a moderate cost, might pursue any study he pleased.

3. That an annual, or perhaps permanent, exhibition of workmanship should be instituted, where good work might be exhibited for a few days and removed. Awards to be made for excellence.

4. Shops for training apprentices, under the direction and supervision of trade firms.

5. A grand central technic college at South Kensington, for the teaching of pure and applied science to the brain-craftsmen. The scheme-plan of this college was given in lithograph.

W. CAVE THOMAS.

A WORKMAN'S DIFFICULTIES.

SIR,—In reading the opinions and able articles dealing with the demand by employers for skilled artisans of the educated class, I see great truths set forth, and in advocating the cause of educated labour I see one great drawback, and that is, that the employer does not take as much interest in the hiring of the men as he ought.

Now my reason for saying so is, that in nearly all cases it is left to the foreman to do so. If a man seeks employment he is told to "see the foreman"; and in doing so, he, in his earnestness to get employment, tells his abilities, in order to get a remunerative wage; and the foreman, perceiving that he is a man likely to know *too much* for the safety of his own position, tells the man that all the benches are full, or some other excuse, and the man goes away and, perhaps, walks about for weeks, whilst an inferior man, who cannot do anything except it be struck out for him, enjoys the blessing of being employed.

Then comes the point, what is the use of intellectual education to a man if in its attainment, either partial or perfect, he has to walk about idle? There is no denying that he is a superior man, and that his knowledge is no burthen to him; but, on the other hand, if he pleads ignorance as to lines, &c., he is looked on as a stupid.

This is the result of employers not giving the men a chance by employing them themselves, and seeing, by their mode of working and setting out of portions of their work themselves, whether they are worth their wages or not. Foremen have not always attainments practical or intellectual, and they look upon those intellectual men under them as highly dangerous to their advanced position.

It will be remarked that where such foremen exist the good hands are generally discharged first, and at the request of the foreman, unless the man happens to be known by the employer, and then the security of the man brings all sorts of differences between the foreman and the employer, because, perhaps, the man suggests a better way of doing something, and the foreman gets piqued over it, and will not do it that way, and if the employer finds that the man is right, and insists on it, then it is with the greatest difficulty that the employer gets the work carried out; and if done the man's way, then the foreman's temper gets the better of him, and he sulks and gets careless.

In a shop where the employer sees what his men can do appreciates turn out better and more fitted to bring credit to themselves and their masters, and will enter into the world with a zest for improvement, and always watching the opportunity to better themselves, and will fasten the principles of their trade well in their minds by the cultivation of

better and more scientific principles than they otherwise would or could have done had they been trained amongst inferior men, with a pompous, self-esteemed, or empty-headed foreman.

I myself, as a good (pardon the word, as my testimonials say so) workman and fair draughtsman in the wood line, and having a good knowledge of smith and stone work (having by application raised myself to be foreman and draughtsman for over ten years in one firm), can testify that such is the case. I had been at work for twelve months in one shop in London, and things being dull at Christmas, I alone got discharged, simply because I knew as much as the foreman, and when he was ill no other man would or could take his place but I; but he got on his legs again, and I, of course, resigned the position to him.

The plea for discharge was that my wages (10d. per hour) could not be afforded any longer till trade revived. Yet withal the governor kept all the duffers on literally walking about, simply because the foreman said it would be unwise to sack them, as he could work with them better than with strangers.

I afterwards applied for employment at three different houses, and was referred to the foreman, and was engaged by one; but, through knowing a man in the shop and speaking to him, the foreman asked him about me, and he immediately sent me word *not* to bring in my tools, as he thought at first there was a bench idle, but afterwards found there was not. I may add that in speaking to the man afterwards he told me that he knew the reason was that he mentioned I could draw.

I then took a job at piecework in my present shop, but have answered several advertisements and got no reply; whether this was the result of wanting 10d. per hour or not I cannot say; but I think a man that is a good cabinet-maker and joiner, and can practically set out a smith's or a mason's job, and design for wood, stone, metal, and decoration, and take the carrying out of the same to suit a good building or church, is worth the money; and if he cannot get 10d. per hour for his labour and brains, what is the use of technical education?

GOTHIC MOULDING.

VALUE OF TIMBER.

SIR,—On an estate now being laid out for building purposes, there is a very large plane tree. It is very straight, and girts at the base over 12 ft. Will one of your correspondents tell me if it is of value? I am somewhat vaguely told it is.

T. C.

THE DESPOTISM OF THE CHARITY COMMISSIONERS.

SIR,—It is not known so generally as it ought to be that when tenders are submitted in public competition for property under the control of the above body, they hawk the highest tender, and tout for a higher bid, so that when a tender is accepted by a body of trustees or a vestry, the party tendering topmost must not make merry, or he will be sent to the Commissioners' Siberia if any one can be found, after his terms have been made public, to give half a crown more for the property.

EXPERIENTIA.

CITY HOTEL PROPERTY, AND ITS VALUE.

ON Friday, the 7th inst., the Metropolitan Hotel, in South-place, Finsbury, upon which upwards of 30,000*l.* was expended in reconstruction a short time ago, and which was opened for business so recently as April last, was sold at the Auction Mart, Tokenhouse-yard, by Messrs. Baker & Son, by direction of the mortgagee. Although the auctioneer dwelt upon the large outlay which had been incurred in rebuilding the hotel, adding that the annual rental was about 2,000*l.* a year, on a lease which had forty-six years to run, independently of the licence, the estimated value of which was 7,000*l.*, the highest bid made for the property was 14,500*l.*, at which sum it was sold. The auctioneer also added that a large business was being done at the hotel, and that the fifty bedrooms it contained were almost all nightly occupied.

RYEHILL CHURCH, DUNDEE.

THIS church, which accommodates 720 persons, has just been erected at a cost of 5,500*l.* Though Gothic in style, the architect has not endeavoured to associate it with any particular period, having aimed at an eclectic use of Gothic forms qualified by a regard to general consistency.

The chief front consists of a gable and tower, the latter crowned with an elongated dome-like roof, and terminated with a cross and ball. This form of tower was chosen by way of contrast to the spires conspicuous in that quarter of Dundee. There is a considerable amount of carving and granite both outside and inside, the apse being further enriched by polished marble shafts. The columns which support the roof are of stone, with carved stone capitals and moulded bases.

The windows are glazed with cathedral glass in quiet tints. The woodwork is partly yellow deal, partly pitch-pine, all stained and varnished; the organ, pulpit, and gallery-front being stencilled in gold and colour. The organ has been erected by Hill & Son, of London.

The heating is on a system of propulsion invented by Mr. Wm. Cunningham, of Dundee. This system insures not only warm, fresh air, in winter, but cool fresh air in summer. Ventilation is by roof openings and hinged window-lights. The architect was Mr. G. S. Aitken, of Dundee.

SURVEYORSHIP ITEMS.

Hove, Brighton.—Mr. Arthur Lewis, assistant-surveyor of Hove, has been appointed surveyor to the Aldrington Estate, a rapidly-rising district to the west of Hove, Brighton.

Liverpool.—Mr. Clement Dunscombe, the newly-appointed borough Engineer, has just been presented by the officials and some of the prominent members of the Derby Corporation, with a number of books, as a token of the esteem in which he was held while he resided in the Midland town.

NEW BANK PREMISES.

Bristol.—The new building for the London and South-Western Bank, on the site of the ancient church of St. Werburgh, in Corn-street, has been partially completed, but owing to litigation relative to the obstruction of light, the progress of the rest of the structure has been delayed. Though the carrying out of portions of the original plan of the architect, Mr. James Weir, has been suspended, the contractors, Messrs. E. C. Howell & Son, of Bristol, have brought the remainder, including the banking apartments and the Corn-street, and half of the Small-street elevation, to completion, and the bank premises have been opened for business. In accordance with the architect's original design (of which we gave a view in our volume for last year, p. 543), the construction of the buildings was to have cost 18,000*l.*, and the elevation was to have been the same (66 ft. from the ground line) throughout the space occupied,—50 ft. in length in Corn-street, and 95 ft. in Small-street; but the litigation with the proprietors of the Commercial-rooms as to the exclusion of light from their property has resulted in the actual elevation in Small-street extending along half this portion of the site, when it is dwarfed off to a mere wall, while the rear of the building, both on this side and towards Small-street, is also cut down and slopes away from the Commercial-rooms at an angle of 45°, temporary roofs covering these portions of the building. The whole of the exterior of the building is of Bath stone. The door to the banking-hall is at the angle of Small-street and Corn-street, and is surmounted by figures in relief emblematical of Industry and Commerce. The floors are of fireproof construction, with Dennett's patent arching. In the basement, below the street level, is the "strong-room," built in the centre of the site, like a square tower, flanked by passages on all sides, and fitted with Milner's patent doors and locks. Mr. W. H. Williams has been the clerk of the works. The exterior stone-carving has been done by Mr. Seale, of London, and the wood-carving is the work of Mr. Sheppard. The building will be warmed by Boyd's heating apparatus; and Waygood's hydraulic lift will be used for conveying the bullion from the strong-room in the basement to the banking-hall.

Sudbury.—A new bank building for Messrs. Alexanders, Birkbeck, & Co., was opened for business on the 23rd ult. The new building adjoins the Corn Exchange, the style adopted being "Queen Anne." The whole façade is of red bricks, which were specially made by Messrs. Allen, of Sudbury, and are of less thickness than ordinary bricks. The façade is equally divided into four bays, and in that nearest to the Corn-hall is the entrance. The upper part corresponds with the three large windows of the bank which fill the other three bays. The work has been carried out by Messrs. George Grimwood & Sons, Sudbury, from the designs of Mr. Brightwen Binyon, architect, Ipswich.

London and Middlesex Archæological Society.—Mr. S. W. Kershaw, M.A., has consented to act with Mr. George H. Birch as joint hon. sec. of this society. At a meeting held on Monday evening last, Mr. F. G. Hilton Price, F.S.A., read a paper on the recent discoveries on the site of Child's Bank, Temple Bar. To this we will return.

COMPETITIONS.

South Lancing Church.—Six sets of drawings were sent in for the proposed new church at South Lancing. These drawings were examined on the 7th inst. by Mr. J. Oldrid Scott, and, on his recommendation, the Building Committee have selected the designs prepared by Messrs. Hanson & Walker, 5, York-buildings, London, and Priory Gate-terrace, Dover. The drawings sent in by Mr. Horace Bradfield, pupil and assistant to Mr. St. Aubyn, were highly commended by the arbitrator, and to Mr. Bradfield a premium of 10*l.* was awarded. To Messrs. Scott & Hyde, architects, Brighton, a premium of 7*l.* was awarded. The estimated cost of the first block of buildings, consisting of a nave, and containing accommodation for 250 persons, amounts, with incidental expenses, to about 1,300*l.*

Preston Railway Hotel.—The design submitted by Mr. T. Mitchell, of Oldham, has been selected for the first premium, and that by Messrs. Solomons & Ely for the second. We have received two very long analytical communications with the view of discrediting the selection, but must decline to print them.

Cardiff Free Library.—Out of the 107 designs sent in, three,—viz., those bearing the mottoes "Reference," "Thoughtful," and "A Local Effort,"—have been selected, from which the Cardiff corporation is to choose the two prize designs. All three of the designs selected are, it is stated, by local architects. In this case, also, we have received some strong statements in objection.

Shrubsole Memorial.—At last the committee have thought it necessary to make their intentions clear by publishing a few particulars. At the close they say,—"In adopting a design, the remuneration to the author will be a matter of negotiation between himself and the committee." This is altogether objectionable.

PROVINCIAL NEWS.

Norwich.—The Norwich Town Council, at their quarterly meeting on the 24th ult., discussed an offer made by Messrs. Barnard, Bishop, & Barnards to sell to the Corporation the Pavilion, manufactured at the Norfolk Iron Works, from a design by Mr. Jekyll, for the sum of 500*l.*, and it was ascertained that for that sum Messrs. Barnard would build foundations, do all carting, erect the pavilion, and re-paint it, &c. The pavilion is proposed to be erected in Chapel Field, and it was decided to ask Messrs. Barnards to let their offer stand open for three months with the view of obtaining subscriptions for the purchase of the pavilion, which was exhibited at the Paris and Philadelphia exhibitions. The inhabitants of Norwich will do well to secure for themselves so notable a specimen of local workmanship.

Redruth.—A company has been formed for the erection of a mining exchange at Redruth. The building is being erected over the Pork Market, adjoining the new bank and post-office, by Messrs. Gray & Tamblyn, under the superintendence of Mr. Hicks, architect. The cost will be between 300*l.* and 400*l.*

Exeter.—The Exeter Town Council decided on the 25th ult., to erect a new lunatic asylum, there being in other parts of the country over 100 lunatics who belong to the city, and whose maintenance annually takes from 3,000*l.* to 4,000*l.* out of Exeter. Authority was given for the purchase of sixty-six acres of land near the Woodbury Common, at a cost of 2,150*l.*

Ipswich.—The new Fine Art Gallery, which is in course of erection for the Ipswich Fine-Art Club, in High-street, is approaching completion. The building occupies the lower portion of the site which the corporation purchased for the erection of a museum. It is built of red brick, in a style which will correspond with the museum. It extends to the full depth of the site, the dimensions being 103 ft. long by 31 ft. broad, and 28 ft. 6 in. high. The main gallery is 60 ft. long by 28 ft. 6 in. broad. The walls of this room are cased in stained woodwork, and it is lighted from the roof by means of a clear glass lantern-roof externally, with an inner glass ceiling at a height of 18 ft. Beyond the main gallery is a smaller room, 17 ft. 6 in. by 28 ft. 6 in., which will be devoted to water-colours, and which is, except in size, exactly similar to the main room. Messrs. J. B. & F. Bennett are the contractors, Mr. Horace Cheston being the architect.

Clifton.—By the generosity of Mr. W. F.

Lavington, of Clifton, a new church and institute for seamen have been erected in Princes-street, opposite the Local Marine Board Offices. On the ground-floor is a large room, where sailors may gather and read, or play at various games. The building is of stone, with freestone dressing, the style being Early Gothic. There is a turret at the east end of the roof, in which are hung a couple of bells. There is a niche in the south-west corner, in which it is intended shortly to place a figure of "Hope," with the anchor. The figure will be about 6 ft. high. The doors of the church are hung by wrought-iron hinges made by Mr. Chapman, of St. Michael's-hill. The seats in the church are of pitch pine, varnished, with panelled ends, accommodation being provided for about 300 persons. The roof is pointed, of open timber construction, and filled with tracing of pitch pine. The pulpit and reading-desk are of English oak, the former being richly carved. The whole of the building is heated by one of Grundy's hot-air stoves. From the nature of the site the architects were enabled to place the building nearly due east and west. Messrs. Voisey & Wills, of Bristol, were the architects, and Mr. George Gay, Cotham, was the contractor, the cost of the building being about 4,500*l*.

Leeds.—The Yorkshire Fine Art Society, the head-quarters of which are at Leeds, will open a loan exhibition of pictures on May 1st next, and on September 1st an exhibition of modern paintings and other works of art, contributed principally for purposes of sale.

Dunstable.—Mr. F. White's tender, amounting to 1,690*l*., for building the new Dunstable Town-hall, on the site of the old building destroyed by fire some months ago, has been accepted. The work has to be finished by the 1st day of September.

Sheffield.—It is stated that Mr. Ruskin's Museum here has become so crowded with *objets d'art*, and is visited by so many students, that a new wing to the building has become necessary, to defray the cost of which a subscription list has been opened by working men.

Lynn.—At a special meeting last week of the Governors of the West Norfolk and Lynn Hospital, it was unanimously resolved to improve the general arrangement of the hospital, and to build new accident wards, nurses' rooms, &c., in accordance with the plans submitted by Messrs. Adams & Son, architects, King's Lynn.

STAINED GLASS.

Southwold.—The west window of Southwold Church has recently been filled with painted glass as a memorial to the late Mr. S. H. Remnant, who met with an untimely death by an accident while shooting. The subjects chosen for illustration are the Sermon on the Mount, and our Lord preaching from the ship. Each subject is divided into four groups, extending across the width of the window, and surmounted by canopies designed in character with the architecture of the church. The window has been designed and executed by Messrs. Lavers, Barraud, & Westlake.

Hexham Abbey.—Three windows have just been fixed in the north transept of Hexham Abbey Church, at the cost of Dr. Fairless and Mr. James L. Fairless, Kensington, sons of the late Mr. Joseph Fairless, in memory of their parents. Messrs. Hardman & Co. were consulted, and various designs by them were under consideration when, in the autumn of 1878, Mr. James L. Fairless, happening to be in Florence, was struck with the beauty of the windows in the Church of Santa Croce, and especially by that of the Spinelli Chapel, on the north side of the high altar, which appeared to be capable of reproduction and adaptation to the purpose in view. This window contains six figures arranged in two perpendicular series of three, and Messrs. Hardman were commissioned to adapt the subjects for the purpose in view by disposing two figures for each of the three lancets to be filled, the border and exact arrangement of colour being equally adhered to.

An Art Gallery for Manchester.—The Council of the Royal Institution have submitted to the Town Council a proposal for the establishment of a permanent Art Exhibition in the city. They propose to hand over their property, valued at 120,000*l*., to the Council on condition that the latter should invest 50,000*l*., so as to secure to the gallery an income of 2,000*l*. a year. We will return to the subject.

NEW DRAINAGE AND SEWERAGE WORKS.

Blackrock Township (near Dublin).—The Local Government Board have sanctioned the borrowing of 600*l*. for the carrying out of sewerage and other works in this township. Mr. Barnes is the engineer.

East Looe.—At the meeting of the Liskeard Rural Sanitary Authority on the 21st ult., the committee appointed to inquire into the sanitary condition of East Looe recommended that works of sewerage and drainage should be immediately commenced in many streets and parts of streets, and also that the surfaces of some of the streets should be re-laid, to prevent the pools of stagnant, filthy water often lying in the streets. Mr. E. Appleton is the engineer of the proposed works.

Sevenoaks.—At a meeting of the Sevenoaks Local Board on the 1st inst., the following resolution from the Drainage Committee was considered:—"Resolved, that Mr. Hennell be requested to prepare detailed plans and specifications, and draft advertisements for tenders at once, and that before the plans and specifications be adopted by the Board, the same be submitted to Mr. Rogers Field for his opinion." Mr. Hennell attended before the Board, and said he thought the plans would be ready in about three weeks time, when they should be prepared to advertise for tenders for the drainage of the town.

Books.

TESTIMONIAL EDITION.—*The Extravaganzas of J. R. Planché, Esq., Somerset Herald.* 1825-1871. Edited by T. F. DILLON CROKER and STEPHEN TUCKER, *Rouge Croix.* 5 vols. London: Samuel French, 89, Strand. 1879.

WE must here go a little out of our beaten track and accustomed hunting-grounds, and could give several reasons for doing so, but one shall suffice: to help on an endeavour to give pleasure and do good service to one who during a long life has been giving pleasure and doing good service to the English public. It was an excellent idea to bring together these works of delicate wit, wholesome fun, and poetical imaginings which, represented and illustrated as they were from time to time, made delightful the early days of two generations of men and women, and we heartily congratulate Mr. Dillon Croker and Mr. Stephen Tucker on the completion of their self-imposed task. As Mr. Planché himself says, in the few lines with which he takes leave of his friends:—"It is a testimonial of their esteem in a form which constitutes one of the highest compliments that can be paid to a living author." And yet what a risk to run,—what an ordeal to be subject to! to gather together these airy figments of the brain, written, some of them thirty, forty, fifty years ago, to meet the demands of the moment, and to submit them, under changed circumstances and in changed times, to the criticism of to-day. That they fully stand the test shows the sound principles on which they were written; that human nature was dealt with, and that the general rather than the special was aimed at. Opening the fifth volume at random, we light upon a passage in the "New Haymarket Spring Meeting," written and produced in 1855, and recollect quoting it as *apropos* when it was first played. Read it twenty-five years afterwards and it will still be found applicable. *Time* is waking up *London*, two characters in the piece:—

Time. Past twelve.
Lon. D'ye call that morning?
Time. Yes. I do.
Lon. I don't, and so good night.
Time. You'd best take warning:
You may not live to see what you call morning.
Lon. (rising hastily). Good Gracious Street! what do you mean? Explain.
Am I on fire again in Pudding-lane?
Or is an earthquake likely up to swallow me?
Time. Can't tell. I never know what ills may follow me.
I only say, when I am here, don't lose me,
And then for your own negligence abuse me;
When the steed's stolen folks the stable-door lock,
Though they've been told to take Time by the forelock.
Lon. The proverb's somewhat musty.
Time. From neglect;
Like many things in London, I suspect.
Lon. You're saucy!
Time. No, I'm only plain and true.
Time has done wonders in his time for you,
And now that he has brought you to maturity,
Thinks you should do a little for futurity.
Lon. It's my belief you're one of the Committee
That has been lately sitting on the City,
Calling me over my own coals, and making
A fuss about the money I've been taking,
Bidding me set my Mansion House in order,
And of my sentence be my own Recorder.
Time. Well, Time has had a hand in it, I own;
I am a watchman, on my beat well known,
And, if folks stop the way of Progress just,
I cry, "Move on, there!" and move on they must.
Lon. And have I not obey'd you in my movements?
Look at the thousands I've spent on improvements.
Haven't I clear'd out Smithfield's pens and stalls,
And open'd Cannon-street up to St. Paul's?
Time. So far, so good; but don't stop at the corner.

A little dispute then occurs between *London* and *Westminster*:—

Lon. Boldly, indeed! Dost thou not seek my fall?
Wouldst not wrench from me cap, sword, mace, and all?
Put down my show, suppress my Corporation,
Of my own Thames dispute the conservation,
Give my Lord Mayor and Sheriffs both the bag,
Make of my Livery mere tag and rag,
Chase Common hunt, and silence Common Crier,
Fling all my precious green fat in the fire,
Hang the whole Court of Aldermen in chains,
And leave of London's glory no remains?
West. You are mistaken. London's glory lies
In her great works and noble charities;
My Parliament is proud of them as you,
And honour gives where honour's justly due.
You're wrong to put yourself in such a passion,
Reform, my dear, is coming into fashion.
Lon. Reform! My ears are weary of the word.
West. It isn't pleasant; but it will be heard.
I'm sure against it Westminster fought hard,
In Covent-garden and Old Palace-yard;
But 'twas no use; so, sister, make your mind up,
And all your old affairs with courage wind up;
Take a fresh start,—go hand in hand with me,
Care less for calipash and calipee,
Your ancient hospitality keep up,
But wider circulate the loving-cup;
Instead of up the Thames alone swan-hopping,
Help me to keep it clean from Kew to Wapping;
Release the poor from pestilential sties,
Think of their rooms more than your companies!
Shall we, whose vital interests mutual are,
Divided see them still by Temple Bar?
Down with all bars that would two sisters sever,
London and Westminster should live for ever!

The real secret, however, of the vitality of these compositions is that they are dramas,—they have each a plot, with a beginning, middle, and end. We may not be led, however, into a critical disquisition. We seek only to record a gratifying event in the life of a veteran dramatist, poet, and archæologist, and to make it more gratifying if we can by informing our readers that the edition is not yet sold off, and that they may help to make the result worthy of its object. The books are most pleasant reading, and may go into any hands. As Charles Mathews wrote on a particular occasion:—"There never was, and never will be, any one like Planché for being witty without coarseness, and throwing those pretty little touches of heart into the midst of his fun, which redeem it from the commonplace, and raise nonsense to the rank of poetry." The list of subscribers appended to the 5th volume is of itself a Testimonial of the most remarkable character.

One word more. In estimating the thankfulness due to Mr. Planché from the playgoing and reading public, it must not be forgotten that these extravaganzas form but one of his claims. His dramatic productions, of which a complete list is given in the volume before us, number 176, seventy-two of them being original productions, not including two or three poetical tales; as, for example, "The Sleeping Beauty in the Wood," and "William with the Ring," which have not yet attained the popularity they deserve, and a long list of topographical, heraldic, and archæological works of permanent and growing interest; and that even when we have said all this, we still leave unmentioned what of themselves would be sufficient to make a reputation, namely, his works on Costume, which stand alone in this country. At the age of eighty-four, our dear old friend is still at work, notwithstanding much physical suffering, and an enemy, if he had one, could not find a black stone to throw at him, if he spent half his life in looking for it.

VARIORUM.

UNDER the title "The South Kensington Museum: Examples of the Works of Art in the Museum, and of the Decoration of the Building, with Brief Descriptions," the first part has been issued by Messrs. Sampson Low & Co. of a serial intended to render the art-treasures of South Kensington available for all classes. It is cheap and good.——Vol. II. of the "Edinburgh Architectural Association Sketch Book," 1878-79 (Waterston & Sons), consists of fifty plates, and includes a considerable amount of interesting matter. It is managed by a committee of twelve, Mr. R. Mortimer being the secretary.——The *British Journal of Photography* describes a picture which has been produced by moonlight:—"On Thursday evening, the 26th ult., about nine o'clock, the exposure was commenced, and was continued for exactly seven hours, the moonlight being anything but bright

or continuous. The result is a picture possessing detail in the brickwork of houses in the very foreground, the definition extending to objects which must be several miles away from the camera, showing the comparative clearness of the atmosphere during the hours when thousands of fires cease to send forth volumes of smoke. During this period, however, though domestic hearths were cold, a fire of another description was depicted upon the plate; a large flour-mill, about a mile distant, was being destroyed by the devouring element, and the bright glare of the conflagration is distinctly rendered, bringing into striking prominence objects in the immediate vicinity."——Cassell's *Technical Educator* treats of the principle of the hammer:—"In order to express the amount of force which the hammer exerts upon the nail, we must consider what weight must be laid upon the head of the nail in order to force it into the wood. This force must evidently be enormous. A nail requires a very large force to pull it out, when friction alone is retaining it, and to force it in must of course require a very much larger force. We may, therefore, be assured that a force at all events of some hundredweights would have to be laid upon the head of a 2-in. nail, in order to force it into the wood. It is, of course, meant that the pressure of this weight is to be simply borne by the nail: we do not mean that the head is to receive a blow with this amount; it would, of course, not be possible to place a heavy load on the head of the nail directly; we must produce the effect by means of levers, or some similar contrivance. Now the head of the hammer must be capable, when it delivers a blow upon the head of the nail, of developing a force for a short time equal to the continued pressure that would be produced by a load of many hundredweights; hence the hammer is a mechanical power, for it transforms the power of the hand into a far larger force. What is the cause of this property of the hammer? It depends upon a remarkable force called the force of inertia, and may also be viewed in connexion with the principle of work to which we have already so often referred. We shall first consider it in the former aspect, and afterwards in the latter. To set a body in motion requires the exertion of force. This is so evident, following as it does from the definition of force, that it is not necessary to dwell upon it. To set the head of the hammer in motion, the force of the hand is required. But when a body has been set in motion, it requires force to stop it. This is nearly as evident as the former statement. When a railway train is in motion, it would require a prodigious force to stop it. When a stone drops upon the ground, it is stopped by the force of reaction which the ground exerts upon it; in short, to change the condition of a body, as to arrest a motion, requires the exertion of force. Now action and reaction are equal and opposite; this is a profound law of Nature not always easy to comprehend. In the present case it asserts that when any force acts upon a body to stop it, the body reacts with an equal force upon the body which endeavoured to stop it. Hence, when the head of the hammer comes into contact with the nail, the head of the nail acts upon the hammer, and the hammer reacts upon the nail. This force of reaction may be enormously great. The amount of the force depends upon the amount of motion which the nail makes. If the nail move but a very small way, the force is great; but if the nail yields easily, the force is comparatively small. This will be evident from the obvious circumstance that a rapidly-moving body exerts a prodigious force of reaction upon any body which endeavours to stop it suddenly, but if the body be stopped gradually it exerts a much less force."

——The *Leisure Hour* says of Sir John Gilbert, R.A.—"To most of our readers the name of Sir John Gilbert, R.A., will be familiar, but many of them will be surprised to learn that this distinguished artist, eminent as a draughtsman on wood, President of the Society of Painters in Water-Colours, and Royal Academician, scarcely received any instruction in art, and is a self-taught as well as a self-made man. Sir John Gilbert was placed by his father in a City office, with the intention that he should become a man of business. Commercial affairs, however, were not to his taste, and he occupied every spare moment in covering sheets of paper with sketches of the characters which came under his notice. Young and old, rich and poor, all were committed to that wonderful memory which in later years poured forth such a profusion of designs as has never been equalled by any other artist for range, for delicate perception of character, and for the power of expressing the most varied emotions in the simplest manner. During the uncongenial hours which were passed at the desk, Gilbert, without a doubt, laid in a great part of the knowledge which he used to such excellent purpose in subsequent years. Success by no means came all at once, and he had his share of disappointments. Though now an Academician, he failed to get into the Academy schools as a student, and had to trust to himself for advancement. Before long he gained employment as a draughtsman on wood, and his very earliest drawings on wood were made for the publications of the Religious Tract Society. When business began to come in plentifully, Gilbert buckled-to and worked as few men ever do. The volumes of the *Illustrated London News*, for the years 1848-1854 testify to his immense industry, and those who are able to recognise his work will be astounded at the large number of drawings which he contributed to that journal in the above-mentioned years. These, however, formed but a small part of his work. This extraordinary productiveness was due to perseverance and to practice, and eventually this vast experience gave him a degree of facility in composition and execution such as has seldom, if ever, been equalled. As a boy, the writer of this notice has often waited whilst Gilbert has made a drawing for some magazine or other publication. The MS. has been read, the composition determined upon, and the drawing executed in less time than most artists would find necessary for the sake of reading the MS. alone. Amongst the most remarkable illustrations with which Gilbert's name is connected is one which appeared in the *Illustrated London News* of the Charge of Balaclava. The original sketch by a "special" arrived at the office, and was sent down to Gilbert with a page-size block. The messenger waited whilst the drawing was being made, and Gilbert completed it, with its hundreds of figures, in *three hours*."

Miscellanea.

The Royal Academy.—Whatever may be the rule influencing members of the Academy in filling up vacant places in their society, we must, in the interests of art generally, point out how essential it appears that the different branches, Sculpture, Architecture, Painting, and Engraving, should, in an institution which can only be genuinely successful in proportion as its constitution is liberal, be represented equally. Without at all wishing to interfere with what Academicians may consider to be their special prerogative, it must be evident, even to outsiders, in looking through the list of members of the Academy, that painters, in number at any rate, appear to enjoy the lion's share of honour, to the consequent disadvantage of their brethren of the other branches of art to which we have referred. As regards Engraving particularly, as we are aware, it took nearly a century to enable those with the magic letters R.A. after their names to decide that professors of that art were entitled to equal honours with themselves, so that even now there is but one engraver a full member of the Royal Academy; whilst with both sculptors and architects it has become chronic and constitutional to complain,—some think with show of reason,—of the meagre encouragement they meet with in the manner their works are shown at the periodical exhibitions and otherwise.—*Daily Chronicle.*

View of the Forth Bridge.—A coloured view of the proposed new bridge across the Firth of Forth has been published by Messrs. George Philips & Son, of Fleet-street. The bridge, it will be remembered, is designed by Sir Thomas Bouch, who also designed the Tay Bridge. The total length is a mile and a half, the length of two of the spans is 1,600 ft., or about one-third of a mile, each; the height of the bridge above high-water is 150 ft., and the height of the towers 600 ft. The system adopted is that of a stiffened and tied suspension bridge, and it suggests a large spider's web, or rather, we should say, the remains of a destroyed web; for a spider's web is harmonious, regular, and complete, whereas in this bridge the effect of incompleteness and absence of design appears to have been aimed at. Its ugliness is beyond description. As reconsideration is to be given to the proposed construction of this bridge, let us hope that some endeavour will be made to improve its appearance.

Salaries in Spring-Gardens.—At the meeting of the Metropolitan Board of Works on the 5th inst., the Works and General Purposes Committee reported that they had proceeded on the resolution of the Board of the 2nd January last referring it to them to consider the subject of the salaries and classification of the subordinate officers of the Board, with a view of ascertaining whether any and what alteration should be made in the position and salary of any of the officers. As the result of their deliberations, the committee submitted a series of recommendations for increasing the salaries of the following, among other officers, viz.:—Messrs. G. Campion, examiner of contractors' accounts, from 350*l.* to 400*l.*; E. Doggett, assistant clerk, from 300*l.* to 350*l.*; J. S. Driver, assistant clerk, 200*l.*; G. W. Wood, assistant clerk, from 187*l.* 10*s.* to 200*l.*; G. L. Gomme, assistant clerk, from 150*l.* to 170*l.*; T. Crooks, superintendent of the Abbey Mills Pumping Station, from 275*l.* to 300*l.*; F. W. Goddard, chief assistant surveyor, from 700*l.* to 800*l.*; A. Mott, assistant surveyor, from 400*l.* to 500*l.*; C. W. White, principal clerk in architect's department, from 300*l.* to 400*l.*; J. J. Sexby, surveyor, from 300*l.* to 400*l.*; T. J. Robertson, first-class assistant in architect's department, from 300*l.* to 400*l.*; W. Garnsey, second-class assistant, at 200*l.*; W. Bradley, second-class assistant, 200*l.*; A. J. Bailey, third-class clerk, 150*l.*; A. Clemence, third-class clerk, 150*l.*; G. Bridges, third-class clerk, 150*l.*; E. J. Harper, fourth-class clerk, 100*l.*; M. Goddard, temporary clerk, 100*l.*; and W. E. Hudson, temporary clerk, 80*l.*,—all the increased salaries and new appointments to date from Christmas last. The recommendations were adopted.

The Expenses of Arbitration.—At the meeting of the Metropolitan Board of Works held on the 5th inst., a report was submitted by the Works and General Purposes Committee stating, for the information of the Board, that a letter had been received from the clerk to the arbitrators and umpire in the case of the Wandsworth Bridge, intimating that the award might be taken up upon payment of 1,794*l.* 12*s.* 6*d.*, the amount of their fees; and that the committee had drawn cheques for that amount. Mr. Dresser-Rogers moved that the report be entered on the minutes. Mr. Runtz said he thought this a matter that ought not to be allowed to pass entirely without remark. This was a most extraordinary charge of 1,794*l.* for three gentlemen for nine days' work; and came out at sixty guineas per day each. One arbitrator would be quite enough, but the Board was compelled to take the arbitration in this form. It did seem to him a monstrous thing that these gentlemen should be able to make these excessive charges. The arbitration in respect of Waterloo Bridge was completed in six days, but this little bridge occupied nine days. The names of the umpire and arbitrators are Sir Henry Tyler, Mr. Littler, Q.C., and Mr. Meadows White, Q.C.

The Metropolitan Bridges.—At a meeting of the Metropolitan Board of Works on the 5th inst., Mr. Dresser-Rogers moved,—"That the order of the Board of the 20th of July, 1877, directing the Works and General Purposes Committee to carry into effect the powers of the Metropolis Toll Bridges Act, 1877, so far as such order authorises the committee to execute repairs or works to the bridges mentioned in the Act, and for that purpose to employ such person or persons as they may deem expedient, be rescinded." He explained that in view of the vast amount of other business before the Works, &c., Committee, and of the careful and continued attention that would have to be devoted to the subject of the extensive works and repairs that would have to be carried out very shortly in connexion with the bridges of the metropolis, it was thought expedient that that matter should be transferred from the Works Committee to a special and separate committee. The motion was agreed to, and the members of the new Bridges Committee were afterwards appointed.

Obituary: Sir John Macneill, F.R.S.—This eminent engineer died at his residence, Orkney House, Cromwell-road, on the 2nd inst., full of years. He was to Ireland what the Stephensons, Brunels, and others were to England. He settled the gauge for Ireland. During the famine there he rendered signal service to Government and his country by devising means for mitigating the prevailing distress.

Painter's Patent Hydrostatic Joint for Gas and Water Mains.—This is an American invention, and so ingenious, that *à priori* we should scarcely have been prepared to expect it would be uniformly successful. The testimonials we have seen appear to place this beyond doubt. It is essentially a lead joint calked by hydrostatic pressure. In the interior of the bell-end of the pipe a groove is cast, about ¼-in. square in cross section, with rounded corners, and within it is cast a leaden ring or gasket, flush with the interior surface of the bell. A clearance of, say ⅛-in. all around, is allowed between the spigot and the bell, for easy entrance. When the sections are entered, a forcing-jack is screwed into a threaded opening in the bell, and a thick, semi-fluid material is forcibly injected into the opening, finding its way between the lead gasket and the bottom of its groove, partially displacing the gasket and forcing it inwardly into tight contact with the spigot at all points of its circumference, forming a solid joint. The forcing-jack is now removed and a screw plug inserted, completing the operation, which in a 12-in. main requires about five minutes. A dozen advantages are claimed for the system, including economy and a more complete result than can otherwise be obtained.

The Fall of Houses at Finsbury Park.—At the last meeting of the Islington Vestry the clerk read a report from the surveyors appointed to examine the ruins and foundations of these buildings, exposed for the examination of the Metropolitan Board of Works, to ascertain whether the construction of the new sewer in Seven Sisters-road by the surveyor of the parish had contributed to the fall of the houses. The surveyors gave it as their opinion that, after a very careful examination of the ruins, they did not think that the sewer works had damaged the houses in question. An inquiry is going on at the Metropolitan Board of Works.

Overcrowding in Whitechapel.—At the meeting of the Whitechapel Vestry, on the 1st inst., Mr. Wrack, the sanitary inspector, reported with reference to the overcrowded condition of two rooms on the ground-floor of 77, Great Garden-street, Mile-end New Town, occupied by a foreigner, and farther reported that upon visiting some houses in White's-row, Spitalfields, he found a similar nuisance on the first-floor of No. 7, caused by the same man. At the time of the visit there were thirty-nine persons,—men, women, and children,—in the room. The usual course for the suppression of the nuisance had been taken.

The Thames Navigation and the Sewage Outfalls.—The inquiry into the alleged formation of sewage mud-banks in the river Thames by the outfall from the metropolitan drainage has now been brought to a close, so far as the taking of evidence is concerned, after having occupied twenty-three days. During the latter portion of the inquiry the sittings have been held at the Westminster Palace Hotel. Sir Charles Hartley was the umpire appointed by the Board of Trade. Mr. F. J. Bramwell was the arbitrator appointed by the Metropolitan Board of Works, and Captain Galton acted in a like capacity for the Conservators of the river Thames.

Proposed New Theatre for Liverpool.—A new theatre about to be erected in Victoria-street, on land adjoining Sheffield Buildings. The designs have been prepared by Messrs. M'Govern & Solaini, architects, Victoria-street, Liverpool. The façade, 72 ft. in width, will be of Gothic design, treated freely. A tower carried up over the principal entrance will form a prominent feature in the composition. The material to be employed is Angelsea stone. The stage will be completely isolated from the auditorium between the performances by a metal curtain let down to meet the pit floor.

Seaford Estate, Limited.—The above company has been formed to develope thirty-six acres of land situated in the front of the existing town of Seaford, and having a frontage to the sea of over 3,000 ft. It is proposed to construct a sea-wall and esplanade, with roads in the rear, and Mr. W. Forbes F. Ashdown, the engineer to the company, estimates the cost of the works at 38,000*l*. The directors are offering shares to the public.

Gunner's, near Bagshot.—The architect from whose designs this house, illustrated in our last, was erected is Mr. John Birch, of John-street, Adelphi. By accident this was not mentioned in the descriptive particulars.

Association of Municipal and Sanitary Engineers and Surveyors.—The next district meeting of this Association will take place on Friday, the 19th of March, the members assembling at half-past eleven a.m. in the Borough Offices, Bond-street, Dewsbury, Yorkshire. A paper will be read, entitled "The Sanitary Condition of Dewsbury, and its Sewerage Works," by Mr. B. C. Cross, C.E., and other papers will be taken if time permits. Works in progress will afterwards be inspected.

Proposed Burial-ground for Rotherhithe. The Rotherhithe Vestry have agreed to the following resolution, on the motion of the Rev. E. J. Beck, viz.:—"That in the opinion of the Vestry it is desirable, in the interest of the inhabitants of the parish of St. Mary, Rotherhithe, that steps be taken to provide a public burial-ground for the use of the parishioners."

Wormwood Scrubbs.—At the meeting of the Metropolitan Board of Works on the 5th inst., it was resolved, on the recommendation of the Parks, Commons, and Open Spaces Committee, that the whole area of Wormwood Scrubbs be drained, at an estimated cost of 2,566*l*.

Rugby Museum.—Mr. T. M. Lindsay, who has been for the past ten years head master of the Belfast Government School of Art, has been appointed head of the Art Department in Rugby, and curator of the Art Museum there.

TENDERS

For rebuilding the Ship Tavern, Minories, for Mr. Thorpe. Mr. W. Ansell, architect. Quantities not supplied:—

Andrews	£2,340	0	0
Sparkes	1,798	0	0
Grimwood	1,643	0	0
Longmead & Way	1,597	0	0
Beale	1,549	0	0

For new timber jetty, on the River Usk, for the Newport Harbour Commissioners. Quantities supplied by the architect, Mr. E. A. Lansdowne:—

Steel & Co.	£1,392	9	3
Preaket	1,066	0	0
Firkank	930	0	0
Miles	900	0	0
Pickthall	795	0	0
Linton (accepted)	760	0	0
For steam-crane for above:—			
Linton	£340	0	0
Appleby	330	0	0
Usk Side Iron Company	319	0	0
Phillips	313	0	0
Hall	300	0	0
Miles	300	0	0
Bethen & Bullpit	300	0	0
Smith	290	0	0
Pickthall	250	0	0
Firbank	250	0	0
Steel & Co. (accepted)	227	11	0

For the erection of new buildings, at the Clarence Esplanade Pier, Southsea, for the Southsea Pier Company. Messrs. Davis & Emanuel, architects. Quantities supplied by Mr. H. P. Foster:—

Hyde, Brothers, & Cook	£7,067 0 0
Perry & Co.	7,200 0 0
Lewis	7,100 0 0
Cooper	6,986 0 0
Leather	6,970 0 0
Hill & Co.	6,920 0 0
Booth & Son	6,900 0 0
Patman & Fotheringham	6,875 0 0
Bramble, Brothers	6,8.2 0 0
W. R. & C. Light	6,800 0 0
Barbidge	6,763 0 0
Ward	6,725 0 0
Williams & Son	6,676 0 0
Grover	6,670 0 0

For Kindergarten Schools, Highbury New Park, for Miss Chreiman. Mr. F. A. Dovey, architect. Quantities by Mr. J. Vaughan:—

	Schools.	Fence, wall, and gates.
White	£950	£47
Williams & Son	920	43
Nightingale	891	51
Boyce	849	45
Grove	833	44
Wagner	800	40

For the erection of a billiard-room, and sundry alterations, Bromley, for Mr. G. Simon. Mr. J. Dale, architect:—

Coney (accepted)	£1,729	0	0

For the erection of parsonage-house, at Leighford, near Stafford, for the Rev. E. C. Perry, exclusive of stabling and farm buildings. Mr. Ernest Long, architect. Quantities by the architects:—

Moss	£2,129	2	3
Whittome	2,124	0	0
Gee	2,060	0	0
Jones & Sons	2,050	0	0
Whittingham	1,995	0	0
Webb & Round	1,850	0	0
Bate	1,790	0	0
Reynolds	1,750	0	0
Marshall	1,739	0	0
Millward's executors	1,628	0	0
Love & Flint (accepted)	1,604	0	0

For the erection of public baths, and school of art and science, for the corporation of Longton. Mr. Arden Hardwicke, architect:—

Clarke	£6,382	0	0
Jukes & Weston	6,260	0	0
Maddox & Bennion	6,210	0	0
Gallimore	5,959	0	0
H. & R. Inskip (accepted)	5,000	0	0

For hospital for sick children, Brighton. Mr. T. Laisson, architect:—

Buckler	£12,065	0	0
Longley	11,467	0	0
Beale	11,245	0	0
Anscombe	11,040	0	0
Barnes	10,600	0	0
Jones & Co.	10,168	0	0
Lockyer	9,768	0	0
Kirk & Randall	9,740	0	0
Chessman & Co. (accepted)	9,560	0	0

For the erection, at Selby-street, Bethnal-green, of bacon drying-stoves, stores, stables, and foreman's dwelling-house, for Mrs. Grace. Mr. F. Le Rossignol, architect:—

Brass	£2,553	0	0
Howard	2,485	0	0
Harper	2,355	0	0
Forrest	2,282	0	0
Durnford & Langham	2,249	0	0
T. & J. Mann	2,247	0	0
Augood (accepted)	2,050	0	0

For stables, &c., at West Hill-road, Sydenham:—

Lawrance	£961	0	0
Crabb	820	0	0
Bowyer	750	0	0

For alterations and additions to premises, in Bateman's-row, Curtain-road, Shoreditch:—

Goodman	£1,367	0	0
Scrivener	1,211	0	0
Shurmur	1,201	0	0
Crabb	1,120	0	0
Conder	1,097	0	0

For rebuilding Nos. 2 and 13, Albion-buildings, Bartholomew-close, E.C. Mr. B. Tabberer, architect:—

Johnson	£1,861	0	0
Rider & Son	1,838	0	0
Nightingale	1,593	0	0
Cohen	1,567	0	0
Mark	1,553	0	0
Crabb	1,535	0	0
Lawrance	1,468	0	0
Sabey	1,381	0	0
Conder	1,357	0	0

For warehouse, No. 43, London-wall. Mr. E. Woodthorpe, architect:—

Outhwaite	£4,139	0	0
Dove, Brothers	3,875	0	0
Ashby, Brothers	3,859	0	0
Jarrett	3,830	0	0
Conder	3,793	,	0
Brass	3,655	0	0
Pritchard	3,632	0	0
Larkin & Son	3,494	0	0
Crabb	3,388	0	0

For repairs at the Licensed Victuallers' Asylum, Old Kent-road. Mr. W. F. Potter, architect:—

Hill	£212	0	0
Wells	206	0	0
Carey	195	0	0
Cawson	187	10	0
Stace	185	0	0
Hersee	173	17	6
Pritchard	169	10	0
Harris	158	10	0
Hayworth (accepted)	145	0	0

For annexation of premises, Nos. 1 and 2, Exchange-buildings, Brixton-road, for Mr. A. Philps. Mr. J. W. Stevens, architect:—

Maxwell Bros.	£376	0	0
Pack Bros. (accepted)	348	0	0
Holliday	333	0	0

For the erection of new residence at Erith, Kent, for Mrs. Stoneham. Mr. Joseph Hewett, architect. Quantities by Mr. W. E. Stoner:—

Sharp	£2,800	0	0
Nightingale	2,795	0	0
Morter	2,697	0	0
Blake	2,660	0	0
Kirk & Randall	2,544	0	0
Wilson & Erton	2,541	0	0

For the erection of an infant school, at Pixham-lane, Dorking, Surrey. Mr. Gilbert R. Redgrave, architect:—

Hamblin Brothers	£780	0	0
Lynn & Dudley	718	0	0
Heselgrave	705	0	0
Colls & Sons	694	0	0
Goddard & Sons (accepted)	677	0	0
Putney	675	0	0

For building St. James's church, Forest Gate.

Staines	£5,784	0	0
Award	5,777	0	0
Grimwood & Sons	5,698	0	0
Haines	5,600	0	0
Wood	5,589	0	0
North	5,500	0	0
Holland	5,237	0	0
Shurmur	5,196	0	0
Everitt & Sons	5,195	0	0
Jones	5,180	0	0
Sheffield & Prebble	5,173	0	0
Gregor	4,789	0	0
Castle	4,545	0	0

For completing Nos. 1 and 2, Bellevue, Silverdale, Sydenham, for Mr. E. Howard. Quantities supplied by Mr. F. Dashwood:—

Steel, Brothers (accepted)	£365	0	0

For new mineral water manufactory, in Kingsbury, for Messrs. Samuel Gulliver & Co. Messrs. Taylor & Grist, architects. Quantities supplied by the architects:—

Snell & Co.	£1,470	9	6
Spittel	1,400	0	0
George	1,450	0	0
Green	1,419	0	0
Osborne	1,386	0	0
Ball, jun.	1,280	0	0
Cooper	1,247	0	0
Reduced estimate.			
Cooper	1,098	0	0
Ball, jun. (accepted)	1,089	0	0

For sheds and stables for the Wimbledon Local Board, Wimbledon:—

Johnson	£3,000	0	0
Ackerman	2,638	9	0
Harmer	2,319	0	0
Haines	2,300	0	0
Thompson	2,285	0	0
Jones & Co.	2,281	0	0
Scott	2,222	10	0
Perkins	2,187	0	0
Nichols	2,174	0	0
Ilee	2,149	0	0
Bull & Son	2,140	0	0
Berle	2,134	0	0

For the erection of girls' school, Grange-street, for the School Board, Burton-on-Trent. Messrs. Giles & Brookhouse, architects. Quantities supplied:—

Shilton	£2,050	0	0
Hodges & Wildman	1,825	0	0
Thompson	1,810	0	0
Messrs. Hunter	1,774	0	0
Maddocks	1,769	0	0
De Ville	1,762	0	0
Mason	1,749	0	0
Wildeman	1,699	0	0
Messrs. Chamberlain	1,698	0	0
Wood	1,650	0	0

For new girls' and infants' schools, at Stapenhill, for the Burton-on-Trent district School Board. Messrs. Giles & Brookhouse, architects. Quantities supplied:—

Hodges & Wildman (accepted)	£2,050	0	0

For additions to the school, at Victoria-road, Burton, for the same School Board. Messrs. Giles & Brookhouse, architects:—

De Ville (accepted)	£749	0	0

For additions to Wellington-street Schools, Burton, for the same School Board. Messrs. Giles & Brookhouse, architects. Quantities supplied:—

Wildeman (accepted)	£422	0	0

For Board School, at Morley, near Derby, with teachers' residence, offices, boundary-walls, &c. Messrs. Giles & Brookhouse, architects. Quantities supplied:—

Walker & Slater (accepted)	£950	0	0

For alterations and additions to the Goat public house, High-street, Kensington. Messrs. Isaacs & Florence, architects. Quantities supplied by Mr. L. C. Riddett:—

	Not including fittings.		
Patman & Fotheringham	£1,473	0	0
Lamble	1,458	0	0
Hockley	1,388	0	0
Cocks	1,365	0	0
Taylor	1,357	0	0
Langmead & Way	1,250	0	0
Stimpson & Co. (accepted)	1,223	0	0

For rebuilding No. 19, Kirby-street, Hatton-garden, for Mr. Jaques. Messrs. J. & S. Flint Clarkson, architects. Quantities not supplied:—

Langmead & Way	£2,297	0	0
Limm	2,219	0	0
M'Lachlan & Sons	2,067	0	0
Scrivener & Co.	1,985	0	0
Harris & Wardroper	1,897	0	0
Brown	1,846	0	0

For new engineering workshops, for Messrs. J. Dewrance & Co., to be built on the site of Nos. 182 to 194, Tabard-street, Southwark. Messrs. George Lansdown & Harriss, architects:—

Mitchell	£6,632	0	0
Holland & Hannen	6,350	0	0
Downs	6,170	0	0
Morter	6,139	0	0
Bird	6,090	0	0
Kirk & Randall (accepted)	6,060	0	0

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Ansell	5,037	0	0
Austen	5,000	0	0
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Jones & Co.	4,190	0	0
Parmenter	4,184	0	0
Bell & Sons	4,160	0	0
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Dix	4,018	0	0
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